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SECTION 01011

GENERAL REQUIREMENTS

1.1 GENERAL

1.1.1 SCOPE: This is an IDIQ contract wherein work will be accomplished through issuance of delivery orders (DD 1449). A delivery order does not necessarily include all the types of work indicated herein under but may contain one, two or all work in one delivery order. The work includes furnishing all labor, material, equipment, transportation, management and supervision for:

a. Replacement of chain link fence and/or chain link fence gates and disposal of removed chain link fence and gates, providing decorative masonry unit fence, painting of both side faces and visible areas of the entire length of the new masonry unit fence, and back filling of holes resulting from removal of chain link fence posts' concrete footings.

b. Construction of enclosures with decorative masonry unit wall for dumpsters and various items of electrical equipment, to include painting of both sides and visible areas of the walls of the enclosures.

1.1.2 Location: Andersen Air Force Base, Guam M.I.

1.1.2.1 The work shall be located at various areas on Andersen Air Force Base or in any Air Force property on Guam, Marianas Island. The exact locations will be as selected by the Contracting Officer and shall be indicated on each delivery order.

1.1.2 Geography: The island of Guam is approximately 30 miles in length with a variable width ranging from 12 to 4 miles at its narrowest point. Approximately 212 square miles, excluding reef formations, the island has two basic geological compositions. The central and northern features are primarily raised limestone with several volcanic formations at Mount Santa Rosa and Mount Mataguak. The northern clifflines drop precipitately into the sea with an elevation ranging from 300 to 600 feet. The southern features are basically volcanic with an elongated mountain ridge dividing the island valleys and coastline. The highest point is Mount Lamlam with an elevation of 1,334 feet.

1.1.3 Climate: Guam's climate is pleasantly warm year-round. The mean annual temperature is 81 degrees; generally, the range is from the low 70's to the middle 80's. The coolest and least humid, marked by prevailing westerly tradewinds, are in December through February. The annual rainfall totals 80 to 110 inches. There are two seasons, the dry and the rainy. The dry season, "fanummangen", begins in December through June. The rainy season, "fanuchanan", falls within the remaining months.

1.2 DRAWINGS AND SPECIFICATIONS

1.2.1 The contractor will be provided a copy of drawings and specifications on a compact disk. The contractor shall be responsible for the production of all necessary hard copies.

1.2.2 Record drawings: The contractor shall maintain at the job site two (2) sets of full size contract drawings, marking them in red to show all variations between construction actually provided and that indicated or specified in the contract documents. Where a choice of materials or methods is permitted herein, or where variations in scope of character of work from the original contract is authorized, the drawings shall be marked to define the construction actually provided. The representation of such change shall conform to standard drafting practice and shall include supplementary notes, legends, and details as necessary to clearly portray the as-built construction. Upon completion of work, both sets of mark-up drawings shall be delivered to the Contracting Officer, and subject to approval before acceptance. Drawings shall be updated daily.

1.2.3 As-built Drawings: One set of reproducible as-built mylar drawings and one set of AUTOCAD Version 14 drawings (on 3 ½" 1.4 megabyte computer diskettes) will be submitted upon completion of the project and prior to final payment.

1.3 LAYING OUT WORK

1.3.1 Dimensions and elevations indicated in layout work shall be verified by the Contractor. Discrepancies between drawings, specifications, and existing conditions shall be referred to the Contracting Officer in writing prior to submitting a bid during the solicitation. Failure to make such notifications shall place responsibility upon the general contractor to carry out work in a satisfactory, workmanlike manner.

1.3.2 The Contractor shall be held responsible for location and elevation of all construction contemplated by the Construction Documents.

1.3.3 Prior to bid, the Contractor shall carefully compare and check all drawings for any discrepancies that in any way affect the locations or elevation of the work to be executed and should any discrepancy be found, the Contractor shall immediately report to the Contracting Officer for verification. Any duplication of work made necessary by failure or neglect on Contractor's part to comply with this function shall be done at the Contractor's sole expense.

1.3.4 The drawings accompanying these specifications indicate the general design and arrangement of all apparatus, fixtures, accessories, etc., necessary to complete the work required. The exact locations or arrangement of pipes, fittings, valves & appurtenances should be established by shop drawings and are subject to minor changes necessitated by field conditions which shall be made as required without additional cost to the Air Force. Measurements shall be verified by actual observations at the construction site, and the

general contractor shall be responsible for all work fitting into place in satisfactory and workmanlike manner meeting the approval of the Contracting Officer.

1.4 SAFETY REQUIREMENTS

1.4.1 Standards: Maintain project in accordance with the following safety and insurance standards:

1.4.1.1 The Corps of Engineers Safety Manual, EM 385-1, latest edition.

1.4.1.2 Occupational Safety and Health Administration (OSHA) Standards:

1.4.1.2.1 The Contractor shall comply with OSHA Standards as well as the Corps of Engineers General Safety Requirements Manual (EM 385-1). The OSHA Standards are subject to change and such changes may affect the Contractor's responsibility to know such changes and effective dates of changes.

1.4.2 Compliance with Laws: The Contractor shall comply with all federal laws, local laws, and Air Force rules and regulations.

1.4.3 Safety Program: The Contractor shall implement a safety plan conforming to the requirements of federal, local laws and Air Force rules and regulations. The Safety Program shall comply with the latest editions of 29 CFR 1910 and 1926 where applicable (copies of these Occupational Safety and Health Standards can be ordered from the Superintendent of Documents, U.S. Government Printing Office, Washington D.C. 20402). Safety plan and implementation shall be the sole responsibility of the contractor. Contractor shall have available a copy of the Safety Program to the Contracting Officer upon request.

1.4.4 Accident Reporting: Submit the OSHA Form 200 or other forms that contain the same information for each recordable occupational injury or illness, lost time accident or property damage of $1,000 or more resulting from job site accidents within 6 days of an accident. Notify the Contracting Officer immediately for all accidents.

1.4.5 Safety of Workers: The Contractor shall be responsible for providing all safety equipment during the performance of this project.

1.4.6 Hazardous Noise: Provide hazardous noise signs, as directed, wherever equipment and work procedures produce sound levels greater than 84 dba or db peak sound level.

1.4.7 Fire Prevention: The Contractor shall comply with all pertinent fire prevention provisions of the National Fire Protection Association and Andersen AFB fire regulations.

1.4.8 Environmental Protection: The Contractor shall ensure that all operations and practices performed under this contract comply with all Federal and Government of Guam Environmental Protection Agency directives applicable to the project.

1.4.9 Safety Fencing:

a. As a minimum, the contractor shall use high visibility 4'-0" high mesh safety fence made from high density polyethylene with a breakload at least 480 pounds per foot (Services & Materials brand LWBF 4100 or approved equal). The fence shall be secured to a 2 x 4 wood frame. The spacing of the frame supports shall not be more than 6'-0" on center. The minimum limits of the fence shall be shown on the project drawings or as designated by the Contracting Officer.

b. The use of ribbon/surveyor's tape for making construction zones is unacceptable.

1.4.9.1 Barricades

a. Where pedestrian and driver safety is endangered it the area of construction work, use traffic barricades with flashing lights. Barricades shall conform to the requirements for type 1 barricades as specified in the American National Standards Institute D6.1-1978, Manual on uniform traffic control devices.

1.4.9.2 Welding

a. Prior to commencing any welding, the contractor shall obtain a welding permit AF Form 103 from the Andersen Air Force Fire Department.

1.5 PROTECTION FOR OPEN FLAME DEVICES

When open flame and/or spark producing devices, i.e., acetylene oxygen welding equipment, electric and welding, etc., are employed for job accomplishment, the following procedure are mandatory:

a. Inspect all surrounding areas and equipment to ensure that combustible substances are not present in any area where contact of metal in a temperature above the flashpoint on any compound is possible.

b. Ensure that no open containers or spills of combustible substances are present.

c. Ensure that ignition is not possible by conduction, convection, radiation, or dispersion of molten metal.

d. Proper protection equipment and practices will be used, i.e., fire resistant blankets, wetting of surrounding area, removal of combustible materials where practicable, earth filled backing, portable fire extinguisher of proper type on hand.

1.6 FIRE PROTECTION

1.6.1 Contractor shall maintain 20 foot wide clear access around construction site and storage for fire fighting equipment and vehicle. Contractor shall not block more than one lane of traffic at all times.

1.6.2 The Contractor shall at all times maintain good housekeeping practices to reduce the risk of fire damage. All scrap materials, rubbish, and trash shall be removed daily from the site.

1.6.3 No storage area will be located in restricted area. Location of storage areas will be determined by the Contracting Officer.

1.6.4 Two (2) fire extinguishers shall be available at each location where cutting and welding is being performed. Where electric or gas welding or cutting is done, interposed shields of incombustible material shall be used to protect against fire damage due to sparks and hot metal. When temporary heating devices are used, a watchman shall be present to cover periods when other workmen are not on the premises.

1.6.5 The Contractor shall provide fire extinguishers in accordance with the recommendation of NFPA Nos. 10 and 214. However, in all cases, a minimum of two (2) fire extinguishers shall be available, rated as 2A40BC.

1.6.6 Fire Codes: The Contractor shall adhere to all requirements of the National Fire Codes and Installation Fire Regulations, as they relate to work on this project.

1.7 INTEGRATING EXISTING WORK

1.7.1 All existing pavement, grass and other improvements shall be protected from damage.

1.7.2 The Contractor’s operations shall be confined to the immediate vicinity of the new work and shall not in any way interfere with or obstruct the ingress or egress to and from adjacent property.

1.7.3 If new work is to be connected to existing work, special care shall be exercised not to disturb or damage the existing work more than necessary. All damaged work shall be replaced, repaired, and restored to its original conditions at no additional cost to the government.

1.8 PATCHING GOVERNMENT-OWNED FACILITIES

Government-owned structures, facilities, streets, curbs, walks, etc., that are damaged or removed due to required excavations or other construction work, shall be patched, repaired or replaced, to the satisfaction of the Contracting Officer.

1.9 STANDARDS

1.9.1 Any material specified by reference to the number, symbol or title of a specific standard such as Commercial Standard, a Federal Specification, a trade associating standard, or other national standard, shall comply with the requirements in the latest revision thereof, and any amendment or supplement thereto, in effect on the date or invitation for proposal, except as limited to type, class or grade, or modified in such reference, and except as otherwise, indicated.

1.9.2 The standard referred to, except as modified in the specifications, shall have full force and effect as though printed in this specification. These standards are not furnished to bidders for the reason that the manufacturers and traders involved are assumed to be familiar with their requirements.

1.9.2.1 Where Federal Specifications are referred to as a measure of quality and standard, they refer to Federal Specifications established by the Procurement Division of the United States Government and are available from Superintendent of Documents, U.S. Government Printing Office.

1.9.2.2 Where Federal Specifications numbers are used, they refer to the latest edition including amendments thereto.

1.9.2.3 Where Commercial Standards are referred to as a measure of quality, standard, and method of fabrication, they refer to Commercial Standards, issued by the U.S. Department of Commerce.

1.9.2.4 Where ASTM Serial Numbers are used, they refer to the latest tentative specifications, standard specifications, standard methods, or standard methods of testing issued by the American Society of Testing Materials.

1.10 CERTIFICATE OF CONFORMANCE

Except where test and/or inspections in connection with structural materials are specified or required by applicable laws, rules and regulations, manufacturer's certificate covering conformance with the requirements of the above mentioned Federal Specification and Commercial Standards may be accepted in lieu of test for such items. Such certificates shall be furnished to the Contracting Officer for all items so specified.

1.11 STORAGE AREAS

The Contractor shall provide both open and covered storage spaces for protection to equipment and materials necessary for the project. Location of storage area will be determined by the Contracting Officer. The Government will not be responsible for the security of those materials. Area assigned shall be kept clean of trash at all times. The grass within fifty (50) feet around the storage area shall be mowed every fifteen (15) days or as directed by the Contracting Officer during the duration of the contract and before

turning over the area to the Contracting Officer or his authorized representative or as directed by the Contracting Officer after duration of the Contract.

1.12 UTILITY OUTAGES

1.12.1 All electrical/water/sewer outages must be requested in writing to the Contracting Officer at least 5 working days in advance of the outages. Guam experiences many power outages. Contractor must furnish if required, generator power to continue the flow of work.

1.12.2 In addition, interruption of water service to any building shall not exceed four hours per day. For activities requiring outages longer than four hours, contractor shall obtain an approval from the Contracting Officer and notify building occupant and Housing Management Office at least three days prior to planned extended outage.

1.13 SUBMITTALS:

The Contractor will provide to the Contracting Officer, within 15 calendar days after receipt of the Notice to Proceed, a copy of the Schedule of Materials Submittals, AF Forms 66, with the "Required Submission Date" column completed. The Contractor will establish required submission dates for each submittal item consistent with timely construction completion. Once established, the schedule will be used by the Government to monitor Contractor Submittals and project specifications, the Schedule of Material Submittals shall govern the Contractor's actions.

1.14 CONSTRUCTION PERMIT FORM

Work shall not commence prior to the Contractor's routing and coordination of the Base Civil Engineer Work Clearance (AF Form 103). Both on and off base coordination are the sole responsibility of the Contractor before commencement of work.

1.15 DELIVERY OF READY-MIXED CONCRETE

The Contractor shall give the Contracting officer five (5) days advance notice for all ready-mixed concrete deliveries.

1.16 LIMITATIONS TO DELIVERY OF READY-MIXED CONCRETE

Ready-mixed concrete twenty (20) cubic yards or more in volume shall not be delivered on base after 1400 hours (2:00 p.m.)

1.17 BURYING OF CABLES

No cables and cables in conduits shall be buried less than twenty four (24) inches below Grade.

1.18 DETECTION OF ASBESTOS-CONTAINING MATERIALS

In the event that the Contractor encounters materials that contain asbestos, or are suspected of containing asbestos or hazardous materials on the jobsite, the Contracting Officer shall be notified immediately.

1.19 CONTRACTOR'S REPRESENTATIVE

The contractor shall designate and assign an on-site construction representative to be present during the construction in accordance with the contract clause entitled "Superintendence by the Contractor". The on-site Project Superintendent/ Manager/Supervisor shall be authorized to make legally binding agreement and shall be fluent in the English language.

1.20 STORMS AND EARTHQUAKE PROVISIONS

1.20.1 Storm Provision: Should warning of wind of tropical storm force or stronger (Tropical Storm Condition 3, TYCOR 3) be issued, the Contractor shall take every practicable precaution to minimize danger to persons, to the work, and to adjacent property. These precautions shall include, but not limited to the removing all loose materials, tools and equipment from exposed locations, and removing or securing other temporary work.

1.20.2 Earthquake Provision: All temporary work, loose materials, tools and equipment shall be maintained such that damage shall be minimized in the event of an earthquake.

1.21 CORROSION CONTROL

All exposed metal surfaces and structures shall be provided with corrosion inhibiting primer coats and two finish coats of corrosion protective paints.

1.22 DEBRIS

The Contractor shall maintain the site clean of all debris. The Contractor at the end of each day shall remove all debris resulting from his work or any wind blown debris from his areas of operation. All debris resulting from the project shall be disposed of at the base landfill or off base at the Contractor's expense. The base landfill's hours of operation are 7:30AM to 3:30PM Monday through Friday.

1.23 ENVIRONMENTAL PROTECTION

The Contractor shall ensure that all operations and practices performed under this contract comply with all Federal and Government of Guam Environmental Protection Agency directives applicable to the project. Refer all environmental questions to the Contracting Officer.

1.24 SECURITY PROCEDURES

All activities on Andersen AFB are subject to periodic drills and alerts. All vehicles may be inspected upon entering the base. The degree of inspection may vary from day to day, depending on threat conditions and military exercises. The Contractor shall be advised of base entry procedures and necessary security actions at the preperformance conference.

1.25 CONTROLLED ACCESS AREAS

1.25.1 Work within the flightline Controlled Area. The Government shall monitor contractor performance during entire contract period. The Contractor shall notify the Contracting Officer 14 calendar days prior to commencement of working in this area, including any breaks between work.

1.25.2 Ensure all vehicles involved in the work have flightline vehicle passes issued by Base Operations. Suggest all vehicles enter/exit via the gate on the North end of Archlight Blvd.

1.26 WORK HOURS

Normal work hours are between 7:30 a.m. and 4:30 p.m., Monday through Friday, excluding Federal Holidays. No work will be performed outside normal duty hour unless authorized in writing by the Contracting Officer. Work outside normal work hours must be requested at least 3 days in advance.

Federal Government Holidays are as follows:

Jan - New Year's Day
Jan - Martin Luther King Jr. Birthday
Feb - Presidents Day
May - Memorial Day
July - Independence Day
Sep - Labor Day
Oct - Columbus Day
Nov - Veterans Day
Nov - Thanksgiving Day
Dec - Christmas Day.

1.27 UTILITY ACCESS

Unless otherwise directed in the contract documents, all reasonable quantities of utilities required for work operations that are available from Government sources will be made available to the Contractor without charge. In the event of power outage, the Contractor is responsible for providing utilities at the Contractor's expense. The contractor shall be responsible for supplying his own source of power and water if government utilities are not available at the site.

1.28 FINAL INSPECTION

1.28.1 The Contractor must request for a final inspection at least five (5) working days prior to the desired inspection date. This request must be in writing addressed to the Contracting Officer.

*** END OF SECTION ****

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 Submittal

Shop drawings, product data, samples, and administrative submittals presented for review and approval.

1.1.2 Types of Submittals

All submittals are classified as indicated in the paragraph "Schedule of Submittal Descriptions." The submittals also are grouped as follows:

a. Shop Drawings: As used in this section, drawings, schedules, diagrams, and other data prepared specifically for this Contract, by the Contractor or through the Contractor by way of a subcontractor, manufacturer, supplier, distributor, or other lower tier contractor, to illustrate a portion of the work.

b. Product Data: Preprinted material such as illustrations, standard schedules, performance charts, instructions, brochures, diagrams, manufacturer's descriptive literature, catalog data, and other data to illustrate a portion of the work, but not prepared exclusively for this Contract.

c. Samples: Physical examples of products, materials, equipment, assemblies, or workmanship that are physically identical to a portion of the work, illustrating a portion of the work or establishing standards for evaluating the appearance of the finished work or both.

d. Administrative and Closeout Submittals: Data presented for reviews and approval to ensure that the administrative requirements of the project are adequately met but not to ensure directly that the work is in accordance with the design concept and in compliance with the Contract documents.

1.1.3 Approving Authority

The person authorized to approve a submittal.

1.1.4 Work

As used in this Section, on- and off-site construction required by the Contract documents, including labor necessary to produce the construction and materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.2 SUBMITTALS

Submit the following in accordance with the requirements of this section.

1.2.1 Records

a. Submittal register

1.2.1.1 Submittal Register

State for each submittal the Contractor's planned submittal date. Submit within 15 days after notice to proceed. Insert dates on copies of the "Submittal Register." Obtain the original from the following source:

a. From a register with submittal items filled in which will be available from the Contracting Officer at the time of the notice to proceed. The specification section number, description of item for which the submittal is required, and approving authority will be listed by the Government.

1.3 FORMAT OF SUBMITTALS

1.3.1 Transmittal Form

Transmit each submittal, except sample installations and sample panels, to the office of the approving authority. Transmit submittals with a transmittal form prescribed by the Contracting Officer and standard for the project. The transmittal form shall identify the Contractor, indicate the date of the submittal, and include information prescribed by the transmittal form and required in the paragraph entitled "Identifying Submittals." Process transmittal forms to record actions regarding sample panels and sample installations.

1.3.2 Identifying Submittals

Identify submittals, except sample panel and sample installation, with the following information permanently adhered to or noted on each separate component of each submittal and noted on the transmittal form. Mark each copy of each submittal identically, with the following:

a. Project title and location.

b. Construction Contract number.

c. The Section number of the specification Section by which the submittal is required.

d. The submittal description number of each component of the submittal.

e. When a resubmission, an alphabetic suffix on the submittal number, to indicate the resubmission.

f. The name, address, and telephone number of the subcontractor, supplier, manufacturer and any other second tier contractor associated with the submittal.

g. Product identification and location in project.

1.3.3 Format for Product Data

a. Present product data submittals for each Section as a complete, bound volume. Include a table of contents listing page and catalog item numbers for product data.

b. Indicate, by prominent notation, each product which is being submitted; indicate the specification Section number and paragraph number to which it pertains.

c. Supplement product data with material prepared for the project to satisfy submittal requirements for which product data does not exist. Identify this material as developed specifically for the project.

1.3.4 Format for Shop Drawings

a Shop drawings shall not be less than 8 1/2 by 11 inches nor more than 30 x 42 inches.

b. Present 8 1/2 x 11 inch sized shop drawings as a part of the bound volume for the submittals required by the Section. Present larger drawings in sets.

c. Include on each drawing the drawing title, number, date, and revision numbers and dates, in addition to the information required in the paragraph entitled "Identifying Submittals."

d. Dimension drawings, except diagrams and schematic drawings; prepare drawings demonstrating interface with other trades to scale. Identify materials and products for work shown.

1.3.5 Format of Samples

a. Furnish samples in the sizes below, unless otherwise specified or unless the manufacturer has prepackaged samples of approximately the same size as specified:

(1) Sample of Equipment or Device: Full size.

(2) Sample of Materials Less Than 2 by 3 inches: Built up to 8 1/2 by 11 inches.

(3) Sample of Materials Exceeding 8 1/2 by 11 inches: Cut down to 8 1/2 by 11 inches and adequate to indicate color, texture, and material variations.

(4) Sample of Linear Devices or Materials: 10-inch length or length to be supplied, if less than 10 inches. Examples of linear devices or materials are conduit and handrails.

(5) Sample of Non-Solid Materials: Pint. Examples of non-solid materials are sand and paint.

(6) Color Selection Samples: 2 inches by 4 inches.

(7) Sample Panel: 4 feet by 4 feet.

(8) Sample Installation: 100 square feet.

b. Samples Showing Range of Variation: Where variations are unavoidable due to the nature of the materials, submit sets of samples of not less than three units showing the extremes and middle of the range.

c. Reusable Samples: Incorporate returned samples into the work only if so specified or indicated. Incorporated samples shall be in undamaged condition at the time of use.

d. Recording of Sample Installation: Note and preserve the notation of the area constituting the sample installation but remove the notation at the final clean up of the project.

e. When a color, texture or pattern is specified in naming a particular manufacturer and style, include one sample of that manufacturer and style, for comparison.

1.3.6 Format of Administrative Submittals

a. When the submittal includes a document which is to be used in the project or become a part of the project record, other than as a submittal, do not apply the Contractor's approval stamp to the document, but to a separate sheet accompanying the document.

1.4 QUANTITY OF SUBMITTALS

1.4.1 Number of Copies of Product Data

a. Submit four copies of submittals of product data requiring review and approval by the Contracting Officer.

1.4.2 Number of Copies of Shop Drawings

Submit shop drawings in compliance with the quantity requirements specified for product data.

1.4.3 Number of Samples

a. Submit two samples, or two sets of samples showing range of variation, of each required item. One approved sample or set of samples will be retained by the approving authority and one will be returned to the Contractor.

b. Submit one sample panel. Include components listed in technical section or as directed.

c. Submit one sample installation, where directed.

d. Submit one sample of non-solid materials.

1.4.4 Number of Copies of Administrative Submittals

a. Unless otherwise specified, submit the administrative submittals compliance with the quantity requirements specified for product data.

b. Submit administrative submittals required under "Operation and Maintenance Manuals" to conform to Section 01730, "Operation and Maintenance Data."

1.5 SCHEDULE OF SUBMITTAL DESCRIPTIONS

SD-01, Data

Submittals which provide calculations, descriptions, or other documentation

regarding the work.

SD-02, Manufacturer's Catalog Data

Data composed of catalog cuts, brochures, circulars, specifications and product data, and printed information in sufficient detail and scope to verify compliance with requirements of the contract documents. A type of product data.

SD-03, Manufacturer's Standard Color Charts

Preprinted illustrations displaying choices of color and finish for a material or product. A type of product data.

SD-04, Drawings

Submittals which graphically show relationship of various components of the work, schematic diagrams of systems, detail of fabrications, layout of particular elements, connections, and other relational aspects of the work. A type of shop drawing.

SD-05, Design Data

Design calculations, mix designs, analyses, or other data, written in nature and pertaining to a part of the work. A type of shop drawing.

SD-06, Instructions

Preprinted material describing installation of a product, system, or material, including special notices and Material Safety Data Sheets, if any, concerning impedances, hazards, and safety precautions. A type of product data.

SD-07, Schedules

A tabular list of data or tabular list including location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work. A type of shop drawing.

SD-08, Statements

A document, required of the Contractor, or through the Contractor by way of a supplier, installer, manufacturer, or other lower tier contractor, the purpose of which is to further the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications, or other verification of quality. A type of shop drawing.

SD-09, Reports

Reports of inspection and laboratory test, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

SD-10, Test Reports

A report signed by an authorized official of a testing laboratory that a material, product, or system identical to the material, product or system to be provided has been tested in accordance with requirements specified by naming the test method and material. The test report must state the test was performed in accordance with the test requirements; state the test results; and indicate whether the material, product, or system has passed or failed the test. Testing must have been within three years of the date of award of this Contract. A type of product data.

SD-11, Factory Test Reports

A written report which includes the findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for this project before it is shipped to the job site. The report must be signed by an authorized official of a testing laboratory and must state the test was performed in accordance with the test requirements; state the test results; and indicate whether the material, product, or system has passed or failed the test. A type of shop drawing.

SD-12, Field Test Reports

A written report which includes the findings of a test made at the job site, in the vicinity of the job site, or on a sample taken from the job site, on a portion of the work, during or after installation. The report must be signed by an authorized official of a testing laboratory or agency and must state the test was performed in accordance with the test requirements; state the test results; and indicate whether the material, product, or system has passed or failed the test. A type of shop drawing.

SD-13, Certificates

Statements signed by responsible officials of a manufacturer of a product, system, or material attesting that the product, system, or material meet specified requirements. The statements must be dated after the award of this contract, name the project, and list the specific requirements which it is intended to address. A type of shop drawing.

SD-14, Samples

Samples, including both fabricated and unfabricated physical examples of materials, products, and units of work as complete units or as portions of units of work. A type of sample.

SD-15, Color Selection Samples

Samples of the available choice of colors, textures, and finishes of a product or material, presented over substrates identical in texture to that proposed for the work. A type of sample.

SD-16, Sample Panels

An assembly constructed at the project site in a location acceptable to the Contracting Officer and using materials and methods to be employed in the work; completely finished; maintained during construction; and removed at the conclusion of the work or when authorized by the Contracting Officer. A type of sample.

SD-17, Sample Installations

A portion of an assembly or material constructed where directed and, if approved, retained as a part of the work. A type of sample.

SD-18, Records

Documentation to ensure compliance with an administrative requirement or to establish an administrative mechanism. A type of administrative submittal.

SD-19, Operation and Maintenance Manuals

Data intended to be incorporated in an Operations and Maintenance Manual. A type of administrative submittal.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

*** END OF SECTION ****

SECTION 01575

TEMPORARY ENVIRONMENTAL CONTROLS

1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910	Occupational Safety and Health Standards
40 CFR 122.26	EPA National Pollutant Discharge Elimination System Permit Regulations
40 CFR 241	Guidelines for Disposal of Solid Waste
40 CFR 243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
40 CFR 258	Subtitle D Landfill Requirements
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Generators of Hazardous Waste
40 CFR 263	Transporters of Hazardous Waste
40 CFR 264	Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standard for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Management of Specific Hazardous Waste and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions

40 CFR 279	Used Oil Regulations
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 372-SUBPART D	EPA Toxic Chemical Release Reporting Regulations
49 CFR 173	Shipments and Packagings

ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 832-R-92-005	Storm Water Management for Construction Activities

1.2 DEFINITIONS

1.2.1 Sediment

Soil and other debris that have eroded and have been transported by runoff water or wind.

1.2.2 Solid Waste

Garbage, refuse, debris, sludge, or other discharged material (except hazardous waste as defined in paragraph entitled "Hazardous Waste" or hazardous debris as defined in paragraph entitled "Hazardous Debris"), including solid, liquid, semisolid, or contained gaseous materials resulting from domestic, industrial, commercial, mining, or agricultural operations. Material not regulated as solid waste are: nuclear source or byproduct materials regulated under the Federal Atomic Energy Act of 1954 as amended; suspended or dissolved materials in domestic sewage effluent or irrigation return flows, or other regulated point source discharges; regulated air emissions; and fluids or wastes associated with natural gas or crude oil exploration or production.

a. Green waste: The vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass, bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be re-located, or be re-used are not included.

b. Surplus soil: Existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included.

c. Inert construction and demolition debris: Broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may be re-inforced with or contain ferrous wire, rods, accessories and weldments.

d. Wood: Dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated and/or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included.

e. Scrap metal: Scrap and excess ferrous and non-ferrous metals such as re-inforcing steel, structural shapes, pipe and wire that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included.

f. Paint cans: Metal cans that are empty of paints, solvents, thinners and adhesives. If permitted by the paint can label, a thin dry film may remain in the can.

g. Recyclables: Materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable. Metal meeting the definition of lead contaminated or lead based paint contaminated may not be included as recyclable if sold to a scrap metal company. Paint cans may not be included as recyclable if sold to a scrap metal company.

1.2.3 Debris

Non-hazardous solid material generated during the construction, demolition, or renovation of a structure which exceeds 2.5 inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (e.g. cobbles and boulders). A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection.

1.2.4 Hazardous Debris

As defined in paragraph entitled "Debris" of this section, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) per 40 CFR 261; or debris that exhibits a characteristic of hazardous waste per 40 CFR 261.

1.2.5 Chemical Wastes

This includes salts, acids, alkalies, herbicides, pesticides, and organic chemicals.

1.2.6 Garbage

Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

1.2.7 Hazardous Waste

Hazardous waste as defined in 40 CFR 261 or as defined by applicable State and local regulations.

1.2.8 Oily Waste

Petroleum products and bituminous materials.

1.2.9 Class I Ozone Depleting Substance (ODS)

Class I ODS is defined in Section 602(a) of The Clean Air Act and includes the following chemicals:

chlorofluorocarbon-11 (CFC-11)	chlorofluorocarbon-213 (CFC-213)
chlorofluorocarbon-12 (CFC-12)	chlorofluorocarbon-214 (CFC-214)
chlorofluorocarbon-13 (CFC-13)	chlorofluorocarbon-215 (CFC-215)
chlorofluorocarbon-111 (CFC-111)	chlorofluorocarbon-216 (CFC-216)
chlorofluorocarbon-112 (CFC-112)	chlorofluorocarbon-217 (CFC-217)
chlorofluorocarbon-113 (CFC-113)	halon-1211
chlorofluorocarbon-114 (CFC-114)	halon-1301
chlorofluorocarbon-115 (CFC-115)	halon-2402
chlorofluorocarbon-211 (CFC-211)	carbon tetrachloride
chlorofluorocarbon-212 (CFC-212)	methyl chloroform

1.3 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

1.3.1 SD-08 Statements

a. Environmental protection plan G

1.3.2 SD-18 Records

Some of the records listed below are also required as part of other submittals. For the "Records" submittal, maintain on-site a separate three-ring Environmental Records binder and submit at the completion of the project. Make separate parts to the binder corresponding to each of the applicable subitems listed below.

a. Preconstruction survey

b. Waste determination documentation

c. Disposal documentation for hazardous and regulated waste

d. Contractor 40 CFR employee training records

e. Regulatory notification

f. Solid waste disposal report

1.3.2.1 Preconstruction Survey

Perform a preconstruction survey of the project site with the Contracting Officer, and take photographs showing existing environmental conditions in and adjacent to the site. Submit a report for the record.

1.3.2.2 Waste Determination Documentation

The Contractor shall complete a Waste Determination form (provided at the pre-construction conference) for all contractor derived wastes to be generated. The waste determination must be based upon either a constituent listing from the manufacturer used in conjunction with consideration of the process by which the waste was generated, EPA approved analytical data, or laboratory analysis (Material Safety Data Sheets (MSDS) by themselves are not adequate). All support documentation must be attached to the Waste Determination form. As a minimum, a Waste Determination form must be provided for the following wastes (this listing is not all inclusive): oil and latex based painting and caulking products, solvents, adhesives, aerosols, petroleum products, and all containers of the original materials.

1.3.2.3 Disposal Documentation for Hazardous and Regulated Waste

Submit a copy of the applicable EPA and local permit(s), manifest(s), or license(s) for transportation, treatment, storage, and disposal of hazardous and regulated waste by permitted facilities.

1.3.2.4 Contractor 40 CFR Employee Training Records

Prepare and maintain employee training records throughout the term of the contract meeting applicable 40 CFR requirements. Submit these training records to the Contracting Officer at the conclusion of the project, unless otherwise directed.

1.3.2.5 Regulatory Notification

The Contractor is responsible for all regulatory notification requirements in accordance with Federal, State and local regulations. The Contractor shall forward copies to the

Contracting Officer prior to commencement of work activities. Typically, regulatory notifications must be provided for the following (this listing is not all inclusive): demolition, renovation, NPDES defined site work, remediation of controlled substances (asbestos, hazardous waste, lead paint).

1.3.2.6 Solid Waste Disposal Report

Monthly the Contractor shall submit a solid waste disposal report to the Contracting Officer. For each waste, the report shall state the classification (using the definitions provided in this section), amount, location, and name of the business receiving the solid waste. The Contractor shall include copies of the waste handling facilities' weight tickets, receipts, bills of sale, and other sales documentation. In lieu of sales documentation, the Contractor may submit a statement indicating the disposal location for the solid waste which is signed by an officer of the Contractor firm authorized to legally obligate or bind the firm. The sales documentation or Contractor certification shall include the receiver's tax identification number and business, EPA or State registration number, along with the receiver's delivery and business addresses and telephone numbers. For each solid waste retained by the Contractor for his own use, the Contractor shall submit on the solid waste disposal report the information previously described in this paragraph. Prices paid or received shall not be reported to the Contracting Officer unless required by other provisions or specifications of this Contract or public law.

1.4 CLASS I ODS PROHIBITION

Class I ODS as defined and identified herein shall not be used in the performance of this contract, nor be provided as part of the equipment. This prohibition shall be considered to prevail over any other provision, specification, drawing, or referenced documents.

1.5 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during normal construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Comply with Federal, State, and local regulations pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

1.5.1 Licenses and Permits

Obtain licenses and permits pursuant to the "Permits and Responsibilities" FAR Clause.

1.5.2 Contractor Liabilities for Environmental Protection

The Contractor is advised that this project and the station are subject to Federal, State, and local regulatory agency inspections to review compliance with environmental laws and regulations. The Contractor shall fully cooperate with any representative from any Federal, State or local regulatory agency who may visit the job site and shall provide immediate notification to the Contracting Officer, who shall accompany them on any subsequent site inspections. The Contractor shall complete, maintain, and make available to the Contracting Officer, station, or regulatory agency personnel all documentation relating to environmental compliance under applicable Federal, State and local laws and regulations. The Contractor shall immediately notify the Contracting Officer if a Notice of Violation (NOV) is issued to the Contractor.

The Contractor shall be responsible for all damages to persons or property resulting from Contractor fault or negligence as well as for the payment of any civil fines or penalties which may be assessed by any Federal, State or local regulatory agency as a result of the Contractor's or any subcontractor's violation of any applicable Federal, State or local environmental law or regulation. Should a Notice of Violation (NOV), Notice of Noncompliance (NON), Notice of Deficiency (NOD), or similar regulatory agency notice be issued to the Government as facility owner/operator on account of the actions or inactions of the Contractor or one of its subcontractors in the performance of work under this contract, the Contractor shall fully cooperate with the Government in defending against regulatory assessment of any civil fines or penalties arising out of such actions or inactions.

1.6 ENVIRONMENTAL PROTECTION PLAN

Five days after the award of contract, the Contractor shall meet with the Contracting Officer to discuss the proposed Environmental Protection Plan and develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, and other measures to be taken. The Environmental Protection Plan shall be submitted in the following format and shall, at a minimum, address the following elements (also refer to paragraph entitled "Protection of Natural Resources" in this section):

a. Description of the Environmental Protection Plan

(1) General overview and purpose

(2) General site information

b. Protection of Natural Resources

(1) Land resources

(2) Tree protection

(3) Replacement of damaged landscape features

(4) Temporary construction

c. Protection of Historical and Archaeological Resources

(1) Objectives

(2) Methods

d. Storm Water Management and Control

(1) Ground cover

(2) Erodible soils

(3) Temporary measures

(a) Mechanical retardation and control of runoff

(b) Vegetation and mulch

e. Prevention of Releases to the Environment

(1) Procedures to prevent releases to the environment

(2) Notifications in the event of a release to the environment

f. Protection of the Environment from Waste Derived from Contractor Operations

(1) Control and disposal of solid and sanitary waste

(2) Control and disposal of hazardous waste (Hazardous Waste Management Section)

This item shall consist of the management procedures for all hazardous waste to be generated. The elements of those procedures shall coincide with the Activity Hazardous Waste Management Plan. A copy of the Activity Hazardous Waste Management Plan will be provided by the Contracting Officer. As a minimum, include the following:

(a) Procedures to be employed to ensure a written waste determination is made for appropriate wastes which are to be generated;

(b) Sampling/analysis plan;

(c) Methods of hazardous waste accumulation/storage (i.e., in tanks and/or containers);

(d) Management procedures for storage, labeling, transportation, and disposal of waste (treatment of waste is not allowed unless specifically noted);

(e) Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268);

(f) Management procedures for recyclable hazardous materials such as lead-acid batteries, used oil, and the like;

(g) Used oil management procedures in accordance with 40 CFR 279;

(h) Pollution prevention\hazardous waste minimization procedures;

(i) Plans for the disposal of hazardous waste by permitted facilities;

(j) Procedures to be employed to ensure all required employee training records are maintained.

1.6.1 Environmental Protection Plan Review

Fourteen days after the environmental protection meeting, submit the proposed Environmental Protection Plan for further discussion, review, and approval. Commencement of work shall not begin until the environmental protection plan has been approved.

1.7 UNFORESEEN HAZARDOUS OR REGULATED MATERIAL

If material that is not indicated in the contract documents is encountered that may be dangerous to human health upon disturbance during construction operations, stop that portion of work and notify the Contracting Officer immediately. Intent is to identify materials such as PCB, lead paint, mercury, petroleum products, and friable and nonfriable asbestos. Within 14 calendar days the Government will determine if the material is hazardous. If the material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If the material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to "FAR 52.243-4, Changes" and "FAR 52.236-2, Differing Site Conditions."

2 PRODUCTS

Not used.

3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work. Confine construction activities to within the limits of the work indicated or specified.

3.1.1 Land Resources

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Contracting Officer's permission. Do not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the Contracting Officer. Where such use of attached ropes, cables, or guys is authorized, the Contractor shall be responsible for any resultant damage.

3.1.1.1 Protection of Trees

Protect existing trees which are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. By approved excavation, remove trees with 30 percent or more of their root systems destroyed.

3.1.1.2 Replacement

Remove trees and other landscape features scarred or damaged by equipment operations, and replace with equivalent, undamaged trees and landscape features. Obtain Contracting Officer's approval before replacement.

3.2 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

Carefully protect in-place and report immediately to the Contracting Officer historical and archaeological items or human skeletal remains discovered in the course of work. Stop work in the immediate area of the discovery until directed by the Contracting Officer to resume work. The Government retains ownership and control over historical and archaeological resources.

3.3 EROSION AND SEDIMENT CONTROL MEASURES

3.3.1 Burnoff

Burnoff of the ground cover is not permitted.

3.3.2 Protection of Erodible Soils

Immediately finish the earthwork brought to a final grade, as indicated or specified. Immediately protect the side slopes and back slopes upon completion of rough grading. Plan and conduct earthwork to minimize the duration of exposure of unprotected soils.

3.3.3 Temporary Protection of Erodible Soils

Use the following methods to prevent erosion and control sedimentation:

3.3.3.1 Mechanical Retardation and Control of Runoff

Mechanically retard and control the rate of runoff from the construction site. This includes construction of diversion ditches, benches, berms, and use of silt fences and straw bales to retard and divert runoff to protected drainage courses.

3.3.3.2 Vegetation and Mulch

Provide temporary protection on sides and back slopes as soon as rough grading is completed or sufficient soil is exposed to require erosion protection. Protect slopes by accelerated growth of permanent vegetation, temporary vegetation, mulching, or netting. Stabilize slopes by hydroseeding, anchoring mulch in place, covering with anchored netting, sodding, or such combination of these and other methods necessary for effective erosion control.

3.4 CONTROL AND DISPOSAL OF SOLID WASTES

Pick up solid wastes, and place in covered containers which are regularly emptied. Do not prepare or cook food on the project site. Prevent contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Recycling is encouraged and can be coordinated with the Contracting Officer and the activity recycling coordinator. Remove all solid waste (including non-hazardous debris) from Government property and dispose off-site at an approved landfill. Solid waste disposal off-site must comply with most stringent local, State, and Federal requirements including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

3.4.1 Dumpsters

Equip dumpsters with a secure cover and paint the standard base color. Keep cover closed at all times, except when being loaded with trash and debris. Locate dumpsters behind the construction fence or out of the public view. Empty site dumpsters at least once a week. or as needed to keep the site free of debris and trash. If necessary,

provide 55 gallon trash containers painted the darker base color to collect debris in the construction site area. Locate the trash containers behind the construction fence or out of the public view. Empty trash containers at least once a day. For large demolitions, large dumpsters without lids are acceptable but should not have debris higher than the sides before emptying.

3.5 CONTROL AND DISPOSAL OF HAZARDOUS WASTES

3.5.1 Hazardous Waste/Debris Management

The Contractor shall identify all construction activities which will generate hazardous waste/debris. The Contractor must provide a documented waste determination for all resultant waste streams. Hazardous waste/debris shall be identified, labeled, handled, stored, and disposed of in accordance with all Federal, State, and local regulations including 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, and 40 CFR 268. Hazardous waste shall also be managed in accordance with the approved Hazardous Waste Management Section of the Environmental Protection Plan. Store hazardous wastes in approved containers in accordance with 49 CFR 173. Hazardous waste generated within the confines of Government facilities shall be identified as being generated by the Government. Prior to removal of any hazardous waste from Government property, all hazardous waste manifests must be signed by activity personnel from the Station Environmental Office. No hazardous waste shall be brought onto Government property. Provide to the Contracting Officer a copy of waste determination documentation for any solid waste streams that have any potential to be hazardous waste or contain any chemical constituents listed in 40 CFR 372-SUBPART D. For hazardous wastes spills, verbally notify the Contracting Officer immediately.

3.5.2 Pollution Prevention/Hazardous Waste Minimization

The Contractor shall actively pursue minimizing the use of hazardous materials and the generation of hazardous waste while on-base. The Hazardous Waste Management Section of the Environmental Protection Plan shall include the Contractor's procedures for pollution prevention/ hazardous waste minimization. For preparing this part of the plan, the Contractor may consult the activity Environmental Office for suggestions and to obtain a copy of the installation's pollution prevention/hazardous waste minimization plan for reference material. If no written plan exists, the Contractor may obtain information by contacting the Contracting Officer. The Contractor shall describe the types of the hazardous materials expected to be used in the construction when requesting information.

3.5.3 Hazardous Material Control

The Contractor shall include hazardous material control procedures in the Safety Plan. The procedures shall address and ensure the proper handling of hazardous materials, including the appropriate transportation requirements. The Contractor shall submit a MSDS and estimated quantities to be used for each hazardous material to the

Contracting Officer prior to bringing the material on base. Typical materials requiring MSDS and quantity reporting include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. At the end of the project, the Contractor shall provide the Contracting Officer with the maximum quantity of each material that was present at the site at any one time, the dates the material was present, the amount of each material that was used during the project, and how the material was used. The Contractor shall also ensure that hazardous materials are utilized in a manner that will minimize the amount of hazardous waste that is generated. The Contractor shall ensure that all containers of hazardous materials have NFPA labels or their equivalent. Copies of the MSDS for hazardous materials shall be kept on site at all times and provided to the Contracting Officer at the end of the project. The Contractor shall certify that all hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste per 40 CFR 261.

3.5.4 Petroleum Products

Conduct the fueling and lubricating of equipment and motor vehicles in a manner that protects against spills and evaporation. All used oil generated on site shall be managed in accordance with 40 CFR 279. The Contractor shall determine if any used oil generated while on-site exhibits a characteristic of hazardous waste. In addition, used oil containing 1000 parts per million of solvents will be considered a hazardous waste and disposed of at Contractor's expense. Used oil mixed with a hazardous waste will also be considered a hazardous waste. All hazardous waste will be managed in accordance with the paragraph entitled Hazardous Waste/Debris Management of this section and shall be managed in accordance with the approved Environmental Protection Plan.

3.5.5 Spills of Oil and Hazardous Materials

Take precautions to prevent spills of oil and hazardous material. In the event of a spill, immediately notify the Contracting Officer. Spill response shall be in accordance with 40 CFR 300 and applicable State regulations.

3.6 DUST CONTROL

Keep dust down at all times, including during nonworking periods. Sprinkle or treat, with dust suppressants, the soil at the site, haul roads, and other areas disturbed by operations. Dry power brooming will not be permitted. Instead, use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing will be permitted only for cleaning nonparticulate debris such as steel reinforcing bars. Only wet cutting will be permitted for cutting concrete blocks, concrete, and bituminous concrete. Do not unnecessarily shake bags of cement, concrete mortar, or plaster.

3.7 NOISE

Make the maximum use of low-noise emission products, as certified by the EPA. Blasting or use of explosives will not be permitted.

3.8 RESTRICTIONS ON EQUIPMENT

3.8.1 Electromagnetic Interference Suppression

Electromagnetic Motors: Motors shall comply with MIL-STD-461 relative to radiated and conducted electromagnetic interference. A test for electromagnetic interference will not be required for motors that are identical physically and electrically to those that have previously met the requirements of MIL-STD-461. An electromagneitic interference suppression test will not be required for electric motors without commutation or slipring having no more than one starting contact and operated at 3,600 revolutions per minute or less.

Contractor's Constuction Equipment: Equipment used by the Contractor shall comply with MIL-S-16165 for internal combustible engines and MIL-STD-461 for other devices capable of producing radiated or conducted interference.

Test for Electromagnetic interference Suppression: conduct tests on electric motors and the Contractor's construction equipment in accordance with MIL-STD-462. The test locaion shall be reasonably free from radiated and conducted interference. Furnish the testing equipment, instruments, and personnel for making the tests, a test location and other necessay facilities.

SECTION 02821

CHAIN LINK FENCES AND GATES

4 GENERAL

4.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B 117	(1995) Operating Salt Spray (Fog) Apparatus
ASTM C 94	(1996) Ready-Mixed Concrete
ASTM F 883	(1997) Padlocks
ASTM F 1043	(1995) Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework
ASTM G 23	(1996) Operating Light-Exposure Apparatus (Carbon-Arc Type) with and Without Water for Exposure of Nonmetallic Materials
ASTM G 26	(1996) Operating Light-Exposre Apparatus (Xenon-Arc Type) with and Without Water for Exposure of Nonmettalic Materials
ASTM G 53	(1996) Operating Light- and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials

FEDERAL SPECIFICATIONS (FS)

FS RR-F-191	(Rev. K) Fencing, Wire and Post Metal (and Gates, Chain-Link Fence Fabric, and Accessories) (General Specification)
FS RR-F-191/1	(Rev. D) Fencing, Wire and Post, Metal (Chain-Link Fence Fabric) (Detail Specification)

FS RR-F-191/2	(Rev. D) Fencing, Wire and Post, Metal (Chain-Link Fence Gates) (Detail Specification)
FS RR-F-191/3	(Rev. D) Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces) (Detail Specification)
FS RR-F-191/4	(Rev. D) Fencing, Wire and Post, Metal (Chain-Link Fence Accessories) (Detail Specification)

4.2 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

4.2.1 SD-02 Manufacturer's Catalog Data

a. Chain-link fencing components

b. Accessories

4.2.2 SD-06 Instructions

a. Fence

4.2.3 SD-10 Test Reports

a. Weight in ounces for zinc coating

b. Thickness of PVC coating

4.2.3.1 Required Report Data

Submit reports of listing of chain-link fencing and accessories regarding weight in ounces for zinc coating, thickness of PVC coating, and chemical composition and thickness of aluminum alloy coating.

4.2.4 SD-12 Certificates

a. Fabric

b. Posts

c. Braces

d. Framing

e. Rails

f. Tension wires

g. Gates

h. Padlocks

4.3 DELIVERY, STORAGE, AND HANDLING

Deliver materials to site in an undamaged condition. Store materials off the ground to provide protection against oxidation caused by ground contact.

5 PRODUCTS

5.1 CHAIN-LINK FENCING AND ACCESSORIES

FS RR-F-191 and detailed specifications as referenced and other requirements as specified.

5.1.1 Fabric

FS RR-F-191/1; Type I, zinc-coated steel, 9 gage or IV, polyvinyl chloride (PVC) coated over zinc- or aluminum-coated steel, 9-gage core wire size. Mesh size, 2 inches. Provide selvage twisted and barbed at both selvages for fabric 60-inches in height or greater and knuckled at both selvages for fabric less than 60-inches in height. For polyvinyl chloride coated fabric selvage shall be knuckled at both ends. Height of fabric, as indicated.

5.1.2 Gates

FS RR-F-191/2; Type I, single swing, II, double swing, and III single wheel sliding and cantilever sliding. Shape and size of gate frame, as indicated. Framing and bracing members, round of steel alloy. Steel member finish, zinc-coated or PVC-coated over zinc- or aluminum-coated steel. Gate frames and braces of minimum sizes listed in FS RR-F-191/3 for each Class and Grade except that steel pipe frames shall be 1.90 inches od, 0.120 inches minimum wall thickness and aluminum pipe frames and intermediate braces shall be 1.869 inches od, 0.940 lb/ft of length. Gate fabric, as specified for fencing fabric. Barbed wire top on gate, as specified herein. Coating for steel latches, stops, hinges, keepers, and accessories, galvanized or PVC, minimum thickness of 0.010 inch. Gate latches, fork or plunger bar type. Gate leaves more than 8 feet wide shall have intermediate members as necessary to provide rigid construction, free from sag or twist. Gate leaves less than 8 feet wide shall have truss rods or intermediate braces. Attach gate fabric to gate frame in accordance with manufacturer's standards, except that welding will not be permitted. Arrange

padlocking latches to be accessible from both sides of gate, regardless of latching arrangement.

5.1.3 Posts Top Rails and Braces

FS RR-F-191/3 line posts; Class 1, steel pipe, Grade A. End, corner, and pull posts; Class 1, steel pipe, Grade A. Braces and rails; Class 1, steel pipe, Grade A, in minimum sizes listed in FS RR-F-191/3 for each class and grade. Provide PVC color coating, minimum thickness, 0.10 inch.

5.1.4 Fencing Accessories

FS RR-F-191/4. Provide wire ties constructed of the same material as the fencing fabric. Provide accessories with polyvinyl (PVC) coatings similar to that specified for chain-link fabric or framework.

5.1.5 Concrete

ASTM C 94, using 3/4 inch maximum-size aggregate, and having minimum compressive strength of 3000 psi at 28 days.

5.1.6 Grout

Provide grout of proportions one part portland cement to three parts clean, well-graded sand and a minimum amount of water to produce a workable mix.

5.1.7 Padlocks

ASTM F 883, with chain.

6 EXECUTION

6.1 SITE PREPARATION

6.1.1 Clearing and Grading

Clear fence line of trees, brush, and other obstacles to install fencing. Establish a graded, compacted fence line prior to fencing installation. Compact fill used to establish fence line.

6.1.2 Excavation

Excavate to dimensions indicated for concrete-embedded items, except in bedrock. If bedrock is encountered, continue excavation to depth indicated or 18 inches into bedrock, whichever is less, with a diameter in bedrock a minimum of 2 inches larger

than outside diameter of post. Clear post holes of loose material. Dispose of waste material on station, as directed.

6.2 FENCE INSTALLATION

Install fence on prepared surfaces to line and grade indicated. Install fence in accordance with fence manufacturer's written installation instructions except as modified herein.

6.2.1 Post Spacing

Provide line posts spaced equidistantly apart, not exceeding 10 feet on center. Provide gate posts spaced as necessary for size of gate openings. Do not exceed 500 feet on straight runs between braced posts. Provide corner or pull posts, with bracing in both directions, for changes in direction of 15 degrees or more, or for abrupt changes in grade. Provide drawings showing location of gate, corner, end, and pull posts.

6.2.2 Post Setting

Set posts plumb. Allow concrete and grout to cure a minimum of 72 hours before performing other work on posts.

6.2.2.1 Earth and Bedrock

Provide concrete bases of dimensions indicated except in bedrock. Compact concrete to eliminate voids, and finish to a dome shape. In bedrock, set posts with a minimum of one inch of grout around each post. Work grout into hole to eliminate voids, and finish to a dome shape.

6.2.3 Bracing

Brace gate, corner, end, and pull posts to nearest post with a horizontal brace used as a compression member, placed at least 12 inches below top of fence, and a diagonal truss rod and truss tightener used as a tension member.

6.2.4 Top Rails

Install top rails before installing chain-link fabric. Pass top rail through intermediate post caps. Provide expansion coupling spaced as indicated.

6.2.5 Bottom Tension Wires

Install bottom tension wires before installing chain-link fabric, and pull wires taut. Place top and bottom tension wires within 8 inches of respective fabric line.

6.2.6 Fabric

Pull fabric taut and secure fabric to top rail and bottom wire, close to both sides of each post and at maximum intervals of 24 inches on center. Secure fabric to posts using stretcher bars, ties or clips spaced 15 inches on center, or by integrally weaving to integral fastening loops of end, corner, pull, and gate posts for full length of each post. Install fabric on opposite side of posts from area being secured. Install fabric so that bottom of fabric is 2 inches above ground level.

6.3 ACCESSORIES INSTALLATION

6.3.1 Post Caps

Design post caps to accommodate top rail. Install post caps as recommended by the manufacturer.

6.3.2 Supporting Arms

Design supporting arms to accommodate top rail. Install supporting arms as recommended by manufacturer. In addition to manufacturer's standard connections, permanently secure supporting arms to posts. Studs driven by low-velocity powder-actuated tools may be used with steel, wrought iron, ductile iron, or malleable iron. Do not use studs driven by powder-actuated tools with gray iron or other material that will fracture.

6.3.3 Barbed Wire

Install barbed wire on supporting arms above fence posts. Extend each end member of gate frames sufficiently above top member to carry three strands of barbed wire in horizontal alignment with barbed wire strands on the fence. Pull each strand taut and securely fasten each strand to each supporting arm or extended member. Secure wires in accordance with fence manufacturer's recommendations.

6.3.4 Gates

Install swing gates to swing through 180 degrees from closed to open.

6.3.5 Padlocks

Provide padlocks for gate openings and provide chains that are securely attached to gate or gate posts. Provide padlocks keyed alike, and provide two keys for each padlock.

6.4 SECURITY

Install new security fencing, remove existing security fencing, and perform related work to provide continuous security for facility. Schedule and fully coordinate work with Contracting Officer and cognizant Security Officer.

6.5 CLEANUP

Remove waste fencing materials and other debris from the station.

SECTION 02921

TURF

7 GENERAL

7.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN SOD PRODUCERS ASSOCIATION (ASPA)

ASPA GSS	(1988) Guideline Specifications for Sodding

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 602	(1995; Rev. A) Agricultural Liming Materials
ASTM D 4427	(1992) Peat Samples by Laboratory Testing
ASTM E 11	(1995) Wire-Cloth Sieves for Testing Purposes

COMMERCIAL ITEM DESCRIPTIONS (CID)

CID A-A-1909	Fertilizer

DEPARTMENT OF AGRICULTURE (DOA)

DOA FSA	(January 1985) Federal Seed Act Rules and Regulations of the Secretary of Agriculture
DOA SSIR	(April 1984) Soil Survey Investigation Report No. 1, Soil Survey Laboratory Methods and Procedures for Collecting Soil Samples, Soil Conservation Service

7.2 DEFINITIONS

7.2.1 Stand of Turf

95 percent ground cover of the established species.

7.3 SUBMITTALS

Submit the following in accordance with Section 01300, "Submittal Procedures."

7.3.1 SD-02 Manufacturer's Catalog Data

a. Fertilizer

Include physical characteristics, and recommendations.

7.3.2 SD-06 Instructions

a. Erosion Control Materials

7.3.3 SD-10 Test Reports

a. Topsoil composition tests (reports and recommendations).

7.3.3.1 Topsoil Composition Tests

Submit reports for test specified in DOA SSIR.

7.4 DELIVERY, STORAGE, AND HANDLING

7.4.1 Delivery

7.4.1.1 Seed Protection

Protect from drying out and from contamination during delivery, on-site storage, and handling.

7.4.1.2 Fertilizer Delivery

Deliver to the site in original, unopened containers bearing manufacturer's chemical analysis, name, trade name, trademark, and indication of conformance to state and federal laws. Instead of containers, fertilizer may be furnished in bulk with certificate indicating the above information.

7.5 TIME RESTRICTIONS AND PLANTING CONDITIONS

7.5.1 Restrictions

Do not plant when the ground is muddy, or when air temperature exceeds 90 degrees Fahrenheit.

7.6 TIME LIMITATIONS

7.6.1 Seed

Apply seed within twenty four hours after seed bed preparation.

8 PRODUCTS

8.1 SEED

8.1.1 Classification

Provide seed of the latest season's crop delivered in original sealed packages, bearing producer's guaranteed analysis for percentages of mixtures, purity, germination, weedseed content, and inert material. Label in conformance with DOA FSA and applicable state seed laws. Wet, moldy, or otherwise damaged seed will be rejected. Field mixes will be acceptable when field mix is performed on site in the presence of the Contracting Officer.

8.1.2 Composition

Name of Grass or Legume Botanical and Common	Min. Percent Pure Seed
Cynodon Daetylon	90 %

8.2 TOPSOIL

8.2.1 Existing Soil

Modify existing soil to conform to the requirements specified in paragraph entitled "Composition."

8.2.2 On-Site Topsoil

Reusable surface soil stripped and stockpiled on site if requirements specified for topsoil in paragraph entitled "Composition" are met.

8.2.3 Off-Site Topsoil

Conform to requirements specified in paragraph entitled "Composition." Additional topsoil shall be furnished by the Contractor.

8.2.4 Composition

Containing from 8 to 10 percent organic matter as determined by the topsoil composition tests of the Organic Carbon, 6A, Chemical Analysis Method described in DOA SSIR. Maximum particle size, 3/4 inch, with maximum 3 percent retained on 1/4 inch screen. Other components shall be within the following percentages:

Silt	25-50
Clay	10-30
Sand	20-35
pH	5 to 7.6
Soluble Salts	600 ppm maximum

8.3 SOIL CONDITIONERS

Provide singly or in combination as required to meet specified requirements for topsoil. Soil conditioners shall be nontoxic to plants.

8.3.1 Peat

Sphagnum moss peat or Peat moss derived from a freshwater site and conforming to ASTM D 4427 as modified herein. Shred and granulate peat to pass 1/2 inch mesh screen and condition in storage pile for minimum 6 months after excavation.

8.3.2 Sand

Clean and free of materials harmful to plants.

8.3.3 Perlite

Horticultural grade.

8.3.4 Vermiculite

Horticultural grade.

8.3.5 Rotted Manure

Composted, horse or cattle manure containing maximum 25 percent by volume of straw, or other bedding materials. Manure shall be free of stones, sticks, and soil, viable weed seed, and other materials harmful to plants.

8.3.6 Composted Derivatives

Ground bark, nitrolized sawdust, humus, or other wood green waste material free of stones, sticks, and soil stabilized with nitrogen and having the following properties:

8.3.6.1 Particle Size

Minimum percent by weight passing:

No. 4 mesh screen	95
No. 8 mesh screen	80

8.3.6.2 Nitrogen Content

Minimum percent based on dry weight:

Fir Sawdust	0.7
Fir or Pine Bark	1.0

8.3.7 Calcined Clay

Granular particles produced from montmorillonite clay calcined to minimum temperature of 1200 degrees F to the following gradation: minimum 90 percent passing 8 mesh screen, 99 percent retained on 60 mesh screen and, maximum 2 percent passing 100 mesh screen. Bulk density: 40 pounds maximum per cubic foot.

8.4 FERTILIZER

8.4.1 Pre-Plant Fertilizer Mixture

Fertilizer mixtures not to exceed one percent granular dust and CID A-A-1909, as specified below.

8.4.1.1 Fertilizer "A"

Organic, granular fertilizer containing the following minimum percentages, by weight, of plant food nutrients:

16 percent available nitrogen
8 percent available phosphorus
8 percent available potassium
18 percent sulfur
5 percent iron

8.4.1.2 Fertilizer "B"

Synthetic, granular, controlled-release fertilizer containing the following minimum percentages, by weight, of plant food nutrients:

20 percent available nitrogen

5 percent available phosphorus
5 percent available potassium

8.4.1.3 Fertilizer "C"

Controlled release fertilizer, to use with hydroseeding, composed of pills coated with plastic resin to provide a continuous release of nutrients for at least 6 months and containing the following minimum percentages, by weight, of plant food nutrients.

16 percent available nitrogen
7 percent available phosphorus
12 percent available potassium
5 percent iron

8.5 SURFACE TOPDRESSING

Free from, noxious weeds, mold, and other deleterious materials.

8.5.1 Humus

95 percent decomposed vegetable matter and wood fiber with a particle size of 1/4 to 1/2 inch.

8.5.2 Straw

Stalks from oats, wheat, rye, barley, or rice. Furnish in air-dry condition and of proper consistency for placing with commercial mulch blowing equipment.

8.5.3 Hay

Air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Provide only marsh hay for lawn areas.

8.5.4 Wood Cellulose Fiber Mulch

Use recovered materials of either paper-based (100 percent) or wood-based (100 percent) hydraulic mulch. Processed to contain no growth or germination-inhibiting factors and dyed an appropriate color to facilitate visual metering of materials application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 3.5 to 5.0. Use with hydraulic application of grass seed and fertilizer.

8.6 WATER

Source of water to be approved by Contracting Officer, suitable quality for irrigation.

8.7 EROSION CONTROL MATERIALS

8.7.1 Net

Heavy, twisted jute mesh, biodegradable paper fabric with knitted yarns, and standard weave burlap.

9 EXECUTION

9.1 PREPARATION

9.1.1 EXTENT OF WORK

Provide soil preparation, fertilizing, seeding, and surface topdressing of all newly graded finished earth surfaces, unless indicated otherwise, and at all areas inside or outside the limits of construction that are disturbed by the Contractor's operations.

9.1.2 Soil Preparation

Remove existing topsoil to a minimum depth of 4 inches and stockpile. After areas have been brought to finish subgrade elevation, thoroughly till to minimum depth of 6 inches by scarifying, disking, harrowing, or other methods approved by the Contracting Officer.. Remove debris and stones larger than one inch in any dimension remaining on surface after tillage. Spread stockpiled topsoil evenly to provide positive drainage. Provide off-site topsoil to meet indicated finish grade. Do not spread topsoil when excessively wet or dry. Thoroughly mix subgrade and topsoil to a depth of 8 inches by disking, harrowing, tilling or other method approved by the Contracting Officer. Correct irregularities in finished surfaces to eliminate depressions. Protect finished prepared soil areas from damage by vehicular or pedestrian traffic.

9.1.2.1 Soil Conditioner Application Rates

Apply soil conditioners at rates as determined by laboratory soil analysis of the soils at the job site. For bidding purposes only apply at rates for the following:

Peat 2 cubic yards per 1000 square feet.

Sand 2 cubic yards per 1000 square feet.

Perlite 1 cubic yards per 1000 square feet.

Vermiculite 1 cubic yards per 1000 square feet.

Rotted Manure 1 cubic yards per 1000 square feet.

9.1.2.2 Fertilizer Application Rates

Apply fertilizer at rates as determined by laboratory soil analysis of the soils at the job site or top soil supplied but not less than 30 pounds per 1000 square feet.

9.2 SEEDING

9.2.1 Seed Application Seasons and Conditions

Immediately before seeding, restore soil to proper grade and thoroughly moisten soil to a depth of 6 inches. Do not seed when ground is muddy or in an unsatisfactory condition for seeding. If special conditions exist that may warrant a variance in the above seeding dates or conditions, submit a written request to the Contracting Officer stating the special conditions and proposed variance. Apply seed within twenty four hours after seedbed preparation. Sow seed by approved sowing equipment.

9.2.2 Seed Application Method

9.2.2.1 Hydroseeding

Mix seed, fertilizer, and wood cellulose fiber in required amount of water to produce a homogeneous slurry.When hydraulically sprayed on the ground, material shall form a blotterlike cover impregnated uniformly with grass seed. Immediately following the application of the slurry mix, make separate application of wood cellulose mulch at the rate of 800 pounds, dry weight, per acre. Cover shall allow rainfall or applied water to percolate to underlying soil.

9.2.3 Rolling

Immediately after seeding, firm entire area except for slopes in excess of 3 to 1 with a roller not exceeding 90 pounds for each foot of roller width. If seeding is performed with cultipacker-type seeder or by hydroseeding, rolling may be eliminated.

9.2.4 Erosion Control Material

Install in accordance with manufacturer's instructions.

9.2.5 Watering

Start watering areas seeded as required by temperature and wind conditions. Apply water at a rate sufficient to insure thorough wetting of soil to a depth of 6 inches without run off. During the germination process, seed is to be kept actively growing and not allowed to dry out.

9.3 PROTECTION OF TURF AREAS

Immediately after turfing, protect area against traffic and other use.

9.4 RESTORATION

Restore to original condition existing turf areas which have been damaged during turf installation operations. Keep clean at all times at least one paved pedestrian access route and one paved vehicular access route to each building. Clean other paving when work in adjacent areas is complete.

SECTION 03300

CAST-IN-PLACE CONCRETE

10 GENERAL

10.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M182	(1991) Burlap Cloth Made from Jute or Kenaf

AMERICAN CONCRETE INSTITUTE (ACI)

ACI 117	(1990) Tolerances for Concrete Construction and Materials
ACI 211.1	(1991) Selecting Proportions for Normal, Heavyweight, and Mass Concrete
ACI 211.2	(1991) Selecting Proportions for Structural Lightweight Concrete
ACI 213R	(1987) Structural Lightweight Aggregate Concrete
ACI 301	(1996) Structural Concrete for Buildings
ACI 302.1R	(1996) Concrete Floor and Slab Construction
ACI 304R	(1989) Measuring, Mixing, Transporting, and Placing Concrete
ACI 304.2R	(1996) Placing Concrete by Pumping Methods
ACI 305R	(1991) Hot Weather Concreting
ACI 306.1	(1990) Cold Weather Concreting

ACI 315	(1994) Details and Detailing of Concrete Reinforcement
ACI 318/318M	(1995) Building Code Requirements for Structural Concrete
ACI 347R	(1994) Formwork for Concrete

AMERICAN HARDBOARD ASSOCIATION (AHA)

AHA A135.4	(1995) Basic Hardboard

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 82	(1997) Steel Wire, Plain, for Concrete Reinforcement
ASTM A 123/A 123M	(1997; Rev. A) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 185	(1997) Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
ASTM A 496	(1997) Steel Wire, Deformed, for Concrete Reinforcement
ASTM A 497	(1997) Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement
ASTM A 615/A 615M	(1996; Rev. A) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM A 616/A 616M	(1996; Rev. A) Rail-Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A 617/A 617M	(1996; Rev. A) Axle-Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A 706/A 706M	(1996; Rev. B) Low-Alloy Steel Deformed Bars for Concrete Reinforcement
ASTM A 767/A 767M	(1997) Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement
ASTM A 775/A 775M	(1997) Epoxy-Coated Reinforcing Steel Bars

ASTM A 780	(1993; Rev. A) Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM A 934/A 934M	(1997) Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM C 31/C 31M	(1996) Making and Curing Concrete Test Specimens in the Field
ASTM C 33	(1997) Concrete Aggregates
ASTM C 39	(1996) Compressive Strength of Cylindrical Concrete Specimens
ASTM C 42	(1994) Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C 94	(1997) Ready-Mixed Concrete
ASTM C 143	(1990; Rev. A) Slump of Hydraulic Cement Concrete
ASTM C 150	(1997) Portland Cement
ASTM C 171	(1997) Sheet Materials for Curing Concrete
ASTM C 172	(1997) Sampling Freshly Mixed Concrete
ASTM C 173	(1994; Rev. A) Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C 192/C 192M	(1995) Making and Curing Concrete Test Specimens in Laboratory
ASTM C 227	(1990) Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method)
ASTM C 231	(1997) Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 260	(1995) Air-Entraining Admixtures for Concrete
ASTM C 295	(1990) Petrographic Examination of Aggregates for Concrete

ASTM C 309	(1997) Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 330	(1989) Lightweight Aggregates for Structural Concrete
ASTM C 494	(1992) Chemical Admixtures for Concrete
ASTM C 567	(1991) Unit Weight of Structural Concrete
ASTM C 595M	(1997) Blended Hydraulic Cements (Metric)
ASTM C 595	(1994; Rev. A) Blended Hydraulic Cements
ASTM C 618	(1997) Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
ASTM C 881	(1990) Epoxy-Resin-Base Bonding Systems for Concrete
ASTM C 920	(1995) Elastomeric Joint Sealants
ASTM C 989	(1997) Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
ASTM C 1017	(1992) Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C 1107	(1997) Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTM C 1116	(1995) Fiber-Reinforced Concrete and Shotcrete
ASTM C 1240	(1997) Silica Fume for Use in Hydraulic-Cement Concrete and Mortar
ASTM D 1190	(1996) Concrete Joint Sealer, Hot-Applied Elastic Type
ASTM D 1751	(1983; R 1991) Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

ASTM D 1752	(1984; R 1996) Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
ASTM D 1854	(1996) Jet-Fuel-Resistant Concrete Joint Sealer, Hot-Poured Elastic Type
ASTM D 4397	(1996) Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
ASTM E 1155/E 1155M	(1996) Determining Floor Flatness and Levelness Using the F-Number System

AMERICAN WELDING SOCIETY, INC. (AWS)

AWS D1.4	(1998) Structural Welding Code Reinforcing Steel

CORPS OF ENGINEERS (COE)

COE CRD-C-572	(1974) Polyvinylchloride Waterstop

U.S. DEPARTMENT OF COMMERCE PRODUCT STANDARDS (PS)

PS-1	(1995) Construction and Industrial Plywood

FEDERAL SPECIFICATIONS (FS)

FS SS-S-200	(Rev. E; Am. 2) Sealants, Joint, Two-Component, Jet-Blast Resistant, Cold-Applied, For Portland Cement Concrete Pavement
FS UU-B-790	(Rev. A Reinst) Building Paper, Vegetable Fiber: (Kraft, Waterproofed, Water Repellent and Fire Resistant)
FS SS-S-1614	(Rev. A) Sealants, Joint, Jet-Fuel-Resistant, Hot-Applied, for Portland Cement and Tar Concrete Pavements

[_____] DEPARTMENT OF TRANSPORTATION ([_____] DOT)

[_____] DOT RBS	(19[_____]) Road and Bridge Specifications

10.2 DEFINITIONS

a. "Exposed to public view" means situated so that it can be seen from eye level from a public location after completion of the building. A public location is accessible to persons not responsible for operation or maintenance of the building.

10.3 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

10.3.1 SD-04 Drawings

a. Formwork

b. Reinforcing steel G

Reproductions of contract drawings are unacceptable.

10.3.1.1 Formwork

Drawings showing details of formwork including; joints, supports, studding and shoring, and sequence of form and shoring removal. Reproductions of contract drawings are unacceptable.

10.3.1.2 Reinforcing Steel

ACI 315. Indicate bending diagrams, assembly diagrams, splicing and laps of bars, shapes, dimensions, and details of bar reinforcing, accessories, and concrete cover. Do not scale dimensions from structural drawings to determine lengths of reinforcing bars.

10.3.2 SD-05 Design Data

a. Concrete mix design G

Thirty days minimum prior to concrete placement, submit a mix design for each strength and type of concrete. Submit a complete list of materials including type; brand; source and amount of cement and admixtures; and applicable reference specifications. Provide mix proportion data using at least three different water-cement ratios for each type of mixture, which will produce a range of strength encompassing those required for each class and type of concrete required. If source material changes, resubmit mix proportion data using revised source material. No material shall be provided unless proven by trial mix studies to meet the requirements of this specification, unless otherwise approved in writing by the Contracting Officer. The submittal shall clearly indicate where each mix design will be used when more than

one mix design is submitted. Submit additional data regarding concrete aggregates if the source of aggregate changes.

10.3.3 SD-10 Test Reports

a. Concrete mix design G

b. Aggregates

10.3.3.1 Concrete Mix Design

Submit copies of laboratory test reports showing that the mix has been successfully tested to produce concrete with the properties specified and that mix will be suitable for the job conditions. The laboratory test reports shall include mill test and all other test for cement, [silica fume,] aggregates, and admixtures. Provide maximum nominal aggregate size, gradation analysis, percentage retained and passing sieve, and a graph of percentage retained verses sieve size. Test reports shall be submitted along with the concrete mix design. Obtain approval before concrete placement.

10.3.3.2 Aggregates

ASTM C 227 for potential alkali-silica reactions, ASTM C 295 for petrographic analysis.

10.3.4 SD-12 Field Test Reports

a. Compressive strength tests

10.4 MODIFICATION OF REFERENCES

Accomplish work in accordance with ACI publications except as modified herein. Consider the advisory or recommended provisions to be mandatory, as though the word "shall" had been substituted for the words "should" or "could" or "may," wherever they appear. Interpret reference to the "Building Official," the "Structural Engineer," and the "Architect/Engineer" to mean the Contracting Officer.

10.5 DELIVERY, STORAGE, AND HANDLING

Do not deliver concrete until vapor barrier, forms, reinforcement, embedded items, and chamfer strips are in place and ready for concrete placement. ACI 301 for job site storage of materials. Protect materials from contaminants such as grease, oil, and dirt. Ensure materials can be accurately identified after bundles are broken and tags removed.

10.5.1 Reinforcement

Store reinforcement of different sizes and shapes in separate piles or racks raised above the ground to avoid excessive rusting. Protect from contaminants such as grease, oil, and dirt. Ensure bar sizes can be accurately identified after bundles are broken and tags removed.

11 PRODUCTS

11.1 MATERIALS FOR FORMS

Provide wood, plywood, or steel. Use plywood or steel forms where a smooth form finish is required. Lumber shall be square edged or tongue-and-groove boards, free of raised grain, knotholes, or other surface defects. Plywood: PS-1, B-B concrete form panels or better or AHA A135.4, hardboard for smooth form lining. Steel form surfaces shall not contain irregularities, dents, or sags.

11.2 FORM TIES AND ACCESSORIES

The use of wire alone is prohibited. Form ties and accessories shall not reduce the effective cover of the reinforcement.

11.3 CONCRETE

11.3.1 Contractor-Furnished Mix Design

ACI 211.1, ACI 301, and ACI 318/318M except as otherwise specified. The compressive strength (f'c) of the concrete for each portion of the structure(s) shall be as indicated and as specified below.

<TBL>

Location	f'c (Min. 28-Day Comp. Strength) (psi)	ASTM C 33 Maximum Nominal Aggregate (Size No.)	Maximum Range of Slump (inches)	Water-Cement Ratio (by weight)
All areas	3000	67	3-4	0.5

Maximum slump shown above may be increased one inch for methods of consolidation other than vibration. Slump may be increased to 8 inches when superplasticizers are used..

11.3.1.1 Mix Proportions for Normal Weight Concrete

Trial design batches, mixture proportioning studies, and testing requirements for various classes and types of concrete specified shall be the responsibility of the Contractor. Mixture proportions shall be based on compressive strength as determined by test specimens fabricated in accordance with ASTM C 192/C 192M and tested in accordance with ASTM C 39. Samples of all materials used in mixture proportioning studies shall be representative of those proposed for use in the project and shall be accompanied by the manufacturer's or producer's test report indicating compliance with these specifications. Trial mixtures having proportions and consistencies suitable for the work shall be made based on methodology described in ACI 211.1. The trial mixture shall use at least three different water-cement ratios for each type of mixture, which will produce a range of strength encompassing those required for each class and type of concrete required on the project. The maximum water-cement ratio required will be based on equivalent water-cement ratio calculations as determined by the conversion from the weight ratio of water to cement by weight equivalency method. Laboratory trial mixture shall be designed for maximum permitted slump and air content. Each combination of material proposed for use shall have separate trial mixture, except for accelerator or retarder use can be provided without separate trial mixture. The temperature of concrete in each trial batch shall be reported. For each water-cement ratio, at least three test cylinders for each test age shall be made and cured in accordance with ASTM C 192/C 192M and tested in accordance with ASTM C 39 for 7 and 28 days. From these results, a curve shall be plotted showing the relationship between water-cement ratio and strength for each set of trial mix studies. In addition a curve shall be plotted showing the relationship between 7 and 28 day strengths.

11.3.1.2 Required Average Strength of Mix Design

The selected mixture shall produce an average compressive strength exceeding the specified strength by the amount indicated in ACI 301. When a concrete production facility has a record of at least 15 consecutive tests, the standard deviation shall be calculated and the required average compressive strength shall be determined in accordance with ACI 301. When a concrete production facility does not have a suitable record of tests to establish a standard deviation, the required average strength shall be as follows:

a. For f'c less than 3000 psi, 1000 psi plus f'c.

11.4 MATERIALS

11.4.1 Cement

ASTM C 150, Type I or II.

11.4.2 Water

Water shall be fresh, clean, and potable; free from injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances deleterious to concrete.

11.4.3 Aggregates

ASTM C 33, except as modified herein. Furnish aggregates for exposed concrete surfaces from one source. Aggregates shall not contain any substance which may be deleteriously reactive with the alkalies in the cement.

11.4.4 Nonshrink Grout

ASTM C 1107.

11.4.5 Admixtures

ASTM C 494: Type A, water reducing; Type B, retarding; Type C, accelerating; Type D, water-reducing and retarding; and Type E, water-reducing and accelerating admixture. Do not use calcium chloride admixtures.

11.4.5.1 High Range Water Reducer (HRWR) (Superplasticizers)

ASTM C 494, Type F and Type G (HRWR retarding admixture).

11.4.6 Materials for Curing Concrete

11.4.6.1 Impervious Sheeting

ASTM C 171; waterproof paper, clear or white polyethylene sheeting, or polyethylene-coated burlap.

11.4.6.2 Pervious Sheeting

AASHTO M182.

11.4.7 Expansion/Contraction Joint Filler

ASTM D 1751 or ASTM D 1752, 1/2 inch thick, unless otherwise indicated.

11.4.8 Joint Sealants

11.4.8.1 Horizontal Surfaces, 3 Percent Slope, Maximum

ASTM D 1190 or ASTM C 920, Type M, Class 25, Use T. ASTM D 1854 for surfaces subjected to jet fuel.

11.4.8.2 Vertical Surfaces Greater Than 3 Percent Slope

ASTM C 920, Type M, Grade NS, Class 25, Use T.

11.4.9 Epoxy Bonding Compound

ASTM C 881. Provide Type I for bonding hardened concrete to hardened concrete; Type II for bonding freshly mixed concrete to hardened concrete; and Type III as a binder in epoxy mortar or concrete, or for use in bonding skid-resistant materials to hardened concrete. Provide Grade 1 or 2 for horizontal surfaces and Grade 3 for vertical surfaces. Provide Class A if placement temperature is below 40 degrees F; Class B if placement temperature is between 40 and 60 degrees F; or Class C if placement temperature is above 60 degrees F.

11.5 REINFORCEMENT

11.5.1 Reinforcing Bars

ACI 301 unless otherwise specified. ASTM A 615/A 615M and ASTM A 617/A 617M with the bars marked A, S, W, Grade 40.

11.5.2 Welded Wire Fabric

ASTM A 185 or ASTM A 497. Provide flat sheets of welded wire fabric for slabs and toppings.

11.5.3 Wire

ASTM A 82 or ASTM A 496.

11.5.4 Reinforcing Bar Supports

Provide bar ties and supports of coated or non corrodible material.

12 EXECUTION

12.1 FORMS

ACI 301. Provide forms, shoring, and scaffolding for concrete placement. Set forms mortar-tight and true to line and grade. Chamfer above grade exposed joints, edges, and external corners of concrete 0.75 inch unless otherwise indicated. Provide formwork with clean-out openings to permit inspection and removal of debris. Forms submerged in water shall be watertight.

12.1.1 Coating

Before concrete placement, coat the contact surfaces of forms with a nonstaining mineral oil, nonstaining form coating compound, or two coats of nitrocellulose lacquer. Do not use mineral oil on forms for surfaces to which adhesive, paint, or other finish material is to be applied.

12.1.2 Removal of Forms and Supports

After placing concrete, forms shall remain in place for the time periods specified in ACI 347R. Prevent concrete damage during form removal.

12.2 FORMED SURFACES

12.2.1 Tolerances

ACI 347R and as indicated.

12.2.2 As-Cast Form

Provide form facing material producing a smooth, hard, uniform texture on the concrete. Arrange facing material in an orderly and symmetrical manner and keep seams to a practical minimum. Support forms as necessary to meet required tolerances. Material with raised grain, torn surfaces, worn edges, patches, dents, or other defects which will impair the texture of the concrete surface shall not be used.

12.3 PLACING REINFORCEMENT AND MISCELLANEOUS MATERIALS

ACI 301. Provide bars, wire fabric, wire ties, supports, and other devices necessary to install and secure reinforcement. Reinforcement shall not have rust, scale, oil, grease, clay, or foreign substances that would reduce the bond. Rusting of reinforcement is a basis of rejection if the effective cross-sectional area or the nominal weight per unit length has been reduced. Remove loose rust prior to placing steel. Tack welding is prohibited.

12.3.1 Reinforcement Supports

Place reinforcement and secure with galvanized or non corrodible chairs, spacers, or metal hangers. For supporting reinforcement on the ground, use concrete or other non corrodible material, having a compressive strength equal to or greater than the concrete being placed.

12.3.2 Splicing

As indicated. For splices not indicated ACI 301. Do not splice at points of maximum stress. Overlap welded wire fabric the spacing of the cross wires, plus 2 inches.

12.3.3 Cover

ACI 301 for minimum coverage, unless otherwise indicated.

12.3.4 Construction Joints

Locate joints to least impair strength. Continue reinforcement across joints unless otherwise indicated.

12.3.5 Expansion Joints and Contraction Joints

Provide expansion joint at edges of interior floor slabs on grade abutting vertical surfaces, and as indicated. Make expansion joints 1/2 inch wide unless indicated otherwise. Fill expansion joints not exposed to weather with preformed joint filler material. Completely fill joints exposed to weather with joint filler material and joint sealant. Do not extend reinforcement or other embedded metal items bonded to the concrete through any expansion joint unless an expansion sleeve is used. Provide contraction joints, either formed or saw cut or cut with a jointing tool, to the indicated depth after the surface has been finished. Sawed joints shall be completed within 4 to 12 hours after concrete placement. Protect joints from intrusion of foreign matter.

12.4 BATCHING, MEASURING, MIXING, AND TRANSPORTING CONCRETE

ASTM C 94, ACI 301, ACI 302.1R, and ACI 304R, except as modified herein. Batching equipment shall be such that the concrete ingredients are consistently measured within the following tolerances: 1 percent for cement and water, 2 percent for aggregate, and 3 percent for admixtures. Furnish mandatory batch ticket information for each load of ready mix concrete.

12.4.1 Measuring

Make measurements at intervals as specified in paragraphs entitled "Sampling" and "Testing."

12.4.2 Mixing

ASTM C 94 and ACI 301. Machine mix concrete. Begin mixing within 30 minutes after the cement has been added to the aggregates. Place concrete within 90 minutes of either addition of mixing water to cement and aggregates or addition of cement to aggregates if the air temperature is less than 85 degrees F. Reduce mixing time and place concrete within 60 minutes if the air temperature is greater than 85 degrees F except as follows: if set retarding admixture is used and slump requirements can be met, limit for placing concrete may remain at 90 minutes. Additional water may be added, provided that both the specified maximum slump and water-cement ratio are not

exceeded. When additional water is added, an additional 30 revolutions of the mixer at mixing speed is required.

12.4.3 Transporting

Transport concrete from the mixer to the forms as rapidly as practicable. Prevent segregation or loss of ingredients. Clean transporting equipment thoroughly before each batch. Do not use aluminum pipe or chutes. Remove concrete which has segregated in transporting and dispose of as directed.

12.5 PLACING CONCRETE

Place concrete as soon as practicable after the forms and the reinforcement have been inspected and approved. Do not place concrete when weather conditions prevent proper placement and consolidation; in uncovered areas during periods of precipitation; or in standing water. Prior to placing concrete, remove dirt, construction debris, water, snow, and ice from within the forms. Deposit concrete as close as practicable to the final position in the forms. Do not exceed a free vertical drop of 3 feet from the point of discharge. Place concrete in one continuous operation from one end of the structure towards the other. Position grade stakes on 10 foot centers maximum in each direction when pouring interior slabs and on 20 foot centers maximum for exterior slabs.

12.5.1 Footing Placement

Concrete for footings may be placed in excavations without forms upon inspection and approval by the Contracting Officer. Excavation width shall be a minimum of 4 inches greater than indicated.

12.5.2 Vibration

ACI 301. Furnish a spare vibrator on the job site whenever concrete is placed. Consolidate concrete slabs greater than 4 inches in depth with high frequency, internal, mechanical vibrating equipment supplemented by hand spading and tamping. Consolidate concrete slabs 4 inches or less in depth by wood tampers, spading, and settling with a heavy leveling straightedge. Operate vibrators with vibratory element submerged in the concrete, with a minimum frequency of not less than 6000 impulses per minute when submerged. Do not use vibrators to transport the concrete in the forms. Insert and withdraw vibrators approximately 18 inches apart. Penetrate the previously placed lift with the vibrator when more than one lift is required. Place concrete in 18 inch maximum vertical lifts. External vibrators shall be used on the exterior surface of the forms when internal vibrators do not provide adequate consolidation of the concrete.

12.5.3 Application of Epoxy Bonding Compound

Apply a thin coat of compound to dry, clean surfaces. Scrub compound into the surface with a stiff-bristle brush. Place concrete while compound is stringy. Do not permit compound to harden prior to concrete placement. Follow manufacturer's instructions regarding safety and health precautions when working with epoxy resins.

12.5.4 Pumping

ACI 304R and ACI 304.2R. Pumping shall not result in separation or loss of materials nor cause interruptions sufficient to permit loss of plasticity between successive increments. Loss of slump in pumping equipment shall not exceed 2 inches. Concrete shall not be conveyed through pipe made of aluminum or aluminum alloy. Rapid changes in pipe sizes shall be avoided. Maximum size of course aggregate shall be limited to 33 percent of the diameter of the pipe. Maximum size of well rounded aggregate shall be limited to 40 percent of the pipe diameter. Samples for testing shall be taken at both the point of delivery to the pump and at the discharge end.

12.6 SURFACE FINISHES EXCEPT FLOOR, SLAB, AND PAVEMENT FINISHES

12.6.1 Defects

Repair formed surfaces by removing minor honeycombs, pits greater than 1 square inch surface area or 0.25 inchmaximum depth, or otherwise defective areas. Provide edges perpendicular to the surface and patch with nonshrink grout. Patch tie holes and defects when the forms are removed. Concrete with extensive honeycomb including exposed steel reinforcement, cold joints, entrapped debris, separated aggregate, or other defects which affect the serviceability or structural strength will be rejected, unless correction of defects is approved. Obtain approval of corrective action prior to repair. The surface of the concrete shall not vary more than the allowable tolerances of ACI 347R. Exposed surfaces shall be uniform in appearance and finished to a smooth form finish unless otherwise specified.

12.6.2 Not Against Forms (Top of Walls)

Surfaces not otherwise specified shall be finished with wood floats to even surfaces. Finish shall match adjacent finishes.

12.6.3 Formed Surfaces

12.6.3.1 Tolerances

ACI 117 and as indicated.

12.6.3.2 As-Cast Rough Form

Provide for surfaces not exposed to public view. Patch this holes and defects and level abrupt irregularities. Remove or rub off fins and other projections exceeding 0.25 inch in height.

12.7 CURING AND PROTECTION

ACI 301 unless otherwise specified. Begin curing immediately following form removal. Avoid damage to concrete from vibration created by blasting, pile driving, movement of equipment in the vicinity, disturbance of formwork or protruding reinforcement, and any other activity resulting in ground vibrations. Protect concrete from injurious action by sun, rain, flowing water, frost, mechanical injury, tire marks, and oil stains. Do not allow concrete to dry out from time of placement until the expiration of the specified curing period. Do not use membrane-forming compound on surfaces where appearance would be objectionable, on any surface to be painted, where coverings are to be bonded to the concrete, or on concrete to which other concrete is to be bonded. If forms are removed prior to the expiration of the curing period, provide another curing procedure specified herein for the remaining portion of the curing period. Provide moist curing for those areas receiving liquid chemical sealer-hardener or epoxy coating.

12.7.1 Moist Curing

Remove water without erosion or damage to the structure.

12.7.1.1 Ponding or Immersion

Continually immerse the concrete throughout the curing period

12.7.1.2 Fog Spraying or Sprinkling

Apply water uniformly and continuously throughout the curing period. For temperatures between 40 and 50 degrees F, increase the curing period by 50 percent.

12.7.1.3 Pervious Sheeting

Completely cover surface and edges of the concrete with two thicknesses of wet sheeting. Overlap sheeting 6 inches over adjacent sheeting. Sheeting shall be at least as long as the width of the surface to be cured. During application, do not drag the sheeting over the finished concrete nor over sheeting already placed. Wet sheeting thoroughly and keep continuously wet throughout the curing period.

12.7.1.4 Impervious Sheeting

Wet the entire exposed surface of the concrete thoroughly with a fine spray of water and cover with impervious sheeting throughout the curing period. Lay sheeting directly on the concrete surface and overlap edges 12 inches minimum. Provide sheeting not less than 18 inches wider than the concrete surface to be cured. Secure edges and transverse laps to form closed joints. Repair torn or damaged sheeting or provide new sheeting. Cover or wrap columns, walls, and other vertical structural elements from the top down with impervious sheeting; overlap and continuously tape sheeting joints; and introduce sufficient water to soak the entire surface prior to completely enclosing.

12.7.2 Curing Periods

ACI 301 except 10 days for retaining walls, pavement or chimneys, 21 days for concrete that will be in full-time or intermittent contact with seawater, salt spray, alkali soil or waters. Begin curing immediately after placement. Protect concrete from premature drying, excessively hot temperatures, and mechanical injury; and maintain minimal moisture loss at a relatively constant temperature for the period necessary for hydration of the cement and hardening of the concrete. The materials and methods of curing shall be subject to approval by the Contracting Officer.

12.8 FIELD QUALITY CONTROL

12.8.1 Sampling

ASTM C 172. Collect samples of fresh concrete to perform tests specified. ASTM C 31/C 31M for making test specimens.

12.8.2 Testing

12.8.2.1 Slump Tests

ASTM C 143. Take concrete samples during concrete placement. The maximum slump may be increased as specified with the addition of an approved admixture provided that the water-cement ratio is not exceeded. Perform tests at commencement of concrete placement, when test cylinders are made, and for each batch (minimum) or every 20 cubic yards (maximum) of concrete.

12.8.2.2 Compressive Strength Tests

ASTM C 39. Make five test cylinders for each set of tests in accordance with ASTM C 31/C 31M. Precautions shall be taken to prevent evaporation and loss of water from the specimen. Test two cylinders at 7 days, two cylinders at 28 days, and hold one cylinder in reserve. Samples for strength tests of each mix design of concrete placed each day shall be taken not less than once a day, nor less than once for each 100 cubic yards of concrete, nor less than once for each 5000 square feet of surface area for slabs

or walls. For the entire project, take no less than five sets of samples and perform strength tests for each mix design of concrete placed. Each strength test result shall be the average of two cylinders from the same concrete sample tested at 28 days. If the average of any three consecutive strength test results is less than f'c or if any strength test result falls below f'c by more than 500 psi, take a minimum of three ASTM C 42 core samples from the in-place work represented by the low test cylinder results and test. Concrete represented by core test shall be considered structurally adequate if the average of three cores is equal to at least 85 percent of f'c and if no single core is less than 75 percent of f'c. Locations represented by erratic core strengths shall be retested. Remove concrete not meeting strength criteria and provide new acceptable concrete. Repair core holes with nonshrink grout. Match color and finish of adjacent concrete.

SECTION 04230

REINFORCED MASONRY
09/98

13 GENERAL

13.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN CONCRETE INSTITUTE (ACI)

ACI 315	(1994) Details and Detailing of Concrete Reinforcement
ACI 318/318M	(1995) Building Code Requirements for Structural Concrete
ACI 530.1	(1995) Masonry Structures (ASCE 6-95)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 36/A 36M	(1996) Carbon Structural Steel
ASTM A 82	(1997) Steel Wire, Plain, for Concrete Reinforcement
ASTM A 153/A 153M	(1995) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 167	(1996) Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
ASTM A 185	(1997) Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
ASTM A 366/A 366M	(1997) Commercial Quality (CS) Steel, Carbon, (0.15 Maximum Percent) Cold-Rolled
ASTM A 497	(1997) Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement
ASTM A 615/A 615M	(1996; Rev. A) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

ASTM A 616/A 616M	(1996; Rev. A) Rail-Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A 617/A 617M	(1996; Rev. A) Axle-Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A 641/A 641M	(1997) Zinc-Coated (Galvanized) Carbon Steel Wire
ASTM A 653/A 653M	(1997) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A 706/A 706M	(1996; Rev. B) Low-Alloy Steel Deformed Bars for Concrete Reinforcement
ASTM B 370	(1992) Copper Sheet and Strip for Building Construction
ASTM C 55	(1997) Concrete Brick
ASTM C 62	(1997) Building Brick (Solid Masonry Units Made from Clay or Shale)
ASTM C 90	(1997) Load-Bearing Concrete Masonry Units
ASTM C 94	(1997) Ready-Mixed Concrete
ASTM C 216	(1997) Facing Brick (Solid Masonry Units Made from Clay or Shale)
ASTM C 270	(1997) Mortar for Unit Masonry
ASTM C 476	(1995) Grout for Masonry
ASTM C 652	(1997) Hollow Brick (Hollow Masonry Units Made from Clay or Shale)
ASTM C 744	(1997) Prefaced Concrete and Calcium Silicate Masonry Units
ASTM C 780	(1996) Preconstruction and Construction Evaluations of Mortars for Plain and Reinforced Unit Masonry

ASTM C 901	(1993; Rev. A) Prefabricated Masonry Panels
ASTM C 920	(1995) Elastomeric Joint Sealants
ASTM C 1019	(1989; Rev. A, R 1993) Sampling and Testing Grout
ASTM C 1072	(1994) Masonry Flexural Bond Strength
ASTM C 1314	(1997) Construction and Testing Masonry Prisms Used to Determine Compliance with Specified Compressive Strength of Masonry
ASTM D 994	(1994) Preformed Expansion Joint Filler for Concrete (Bituminous Type)
ASTM D 1056	(1991) Flexible Cellular Materials - Sponge or Expanded Rubber
ASTM D 2000	(1996) Rubber Products in Automotive Applications
ASTM D 2287	(1996) Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds
ASTM E 447	(1997) Compressive Strength of Laboratory Constructed Masonry Prisms
ASTM E 514	(1990; R 1996) Water Penetration and Leakage Through Masonry

INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO)

ICBO UBC	(1994) Uniform Building Code

PRECAST/PRESTRESSED CONCRETE INSTITUTE (PCI)

PCI MNL-116	(1985) Quality Control for Plants and Production of Precast Prestressed Concrete Products

13.2 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

13.2.1 SD-04 Drawings

a. Details of steel reinforcement

13.2.1.1 Details of Steel Reinforcement

Provide drawings showing all fabrication dimensions and locations for placing of the reinforcing steel and accessories.

13.2.2 SD-10 Test Reports

13.2.2.1 Unit Strength Method

Compute compressive strength of masonry system "Unit Strength Method," ACI 530.1. Submit calculations and certifications of unit and mortar strength.

13.2.3 SD-11 Factory Test Reports

a. Concrete masonry units

13.3 QUALITY ASSURANCE

13.3.1 Inspection

Inspection is required for structural masonry. Coordinate details with Section 01450, "Quality Control."

13.3.1.1 Masonry Inspection

QC Manager Quality Controls is required for structural masonry. Coordinate control requirements with Section 01450, "Quality Control".

13.3.2]1.3.3 Appearance

After work has started, do not change source of materials if appearance of finished work would be affected.

13.4 DELIVERY, STORAGE, AND HANDLING

a. Handle masonry units to avoid chipping and breaking. Deliver cement and lime in unbroken bags, barrels, or other sealed containers. Containers shall be plainly marked and labeled with manufacturer's name and brand.

b. Protect masonry units from contact with the soil. Protect moisture-controlled units from rain or ground water. Keep anchors, ties, and reinforcement free

of loose rust and scale. Keep cementitious materials dry. Store and handle cement to prevent inclusion of foreign materials. Store aggregates in a manner to avoid contamination or segregation.

13.5 SPARE VIBRATOR

Maintain at least one spare vibrator on site at all times.

13.6 BRACING AND SCAFFOLDING

Provide all bracing and scaffolding necessary for masonry work. Design bracing to resist wind pressure as required by local code.

14 PRODUCTS

14.1 CONCRETE MASONRY UNITS

14.1.1 Hollow Load Bearing Units

ASTM C 90, Type I, normal weight.

14.2 MORTAR

14.2.1 Mortar Properties

ASTM C 270, Type M. Strength (f'm) as indicated. Test in accordance with ASTM C 780. Use Type I portland cement.

14.2.2 Admixtures

Do not use admixtures containing chlorides.

14.2.3 Water

Water for mixing shall be potable.

14.3 GROUT

ASTM C 476, coarse. Slump between 8 and 11 inches. Provide minimum grout strength of 2000 psi in 28 days, as tested by ASTM C 1019.

14.3.1 Admixtures

Do not use air-entrainment, anti-freeze or chloride admixtures.

14.3.2 Ready Mixed Grout

ASTM C 94.

14.4 REINFORCING BARS

14.4.1 Deformed Bars

ASTM A 615/A 615M, ASTM A 616/A 616M or ASTM A 617/A 617M

14.4.2 Fabrication

ACI 530.1.

14.4.3 Bar Positioners

Provide non-metallic positioners that prevent displacement of reinforcing during construction.

14.5 MOVEMENT JOINTS

14.5.1 Contraction Joint Material

14.5.1.1 Rubber Shear Key

ASTM D 2000, 2AA-805. Minimum durometer hardness of 80.

14.5.1.2 PVC Shear Key

ASTM D 2287, Type PVC 654-4. Minimum durometer hardness of 85.

14.5.1.3 Elastomeric Joint Sealant

ASTM C 920.

14.5.1.4 Joint Detail

Size and shape indicated.

14.5.2 Expansion Joint Material

ASTM D 994, ASTM D 1056 Class RE 41, ASTM C 920. Resistant to oils and solvents.

15 EXECUTION

15.1 INSPECTION

Prior to start of work, masonry inspector shall verify the foundation conditions listed in ACI 530.1.

15.2 ERECTION OF MASONRY UNITS

15.2.1 Mortar

Mix all cementitious materials and aggregates between 3 and 5 minutes in mechanical batch mixer with sufficient amount of water to produce workable consistency. Do not hand mix without approval of Masonry Inspector. Do not retemper after 2 1/2 hours.

15.2.2 Bond

Construct masonry in bond pattern indicated.

15.2.3 Solid Units

ACI 530.1, place with fully mortared bed and head joints.

15.2.4 Hollow Units

ACI 530.1.

15.2.5 All Units

a. Place clean units while mortar is soft and plastic. Any unit disturbed to the extent that initial bond is broken shall be removed and relaid in fresh mortar.

b. Cut exposed edges or faces of masonry units smooth or position so that all exposed faces or edges are unaltered manufactured surfaces.

c. At end of each day, cover new work. Step back masonry; do not tooth.

15.2.6 Tolerances

ACI 530.1.

15.2.7 Bed and Head Joints

Joints shall be 3/8 inch thick, except that bed joint of starting course placed over foundations may be 1/4 inch to 3/4 inch thick.

15.2.8 Finishing Joints

a. In exposed and below grade masonry, fill holes created by line pins with mortar.

b. Tool joints with round or vee jointer when mortar is thumb print hard. After joints are tooled, trim off mortar burrs with trowel. Tool the exterior joints of the interior wythe of cavity walls.

c. Remove masonry protrusions extending 1/2 inch or more into cells or cavities to be grouted.

15.2.9 Collar Joints

Solidly fill collar joints less than 3/4 inch wide with mortar as job progresses.

15.3 REINFORCEMENT

15.3.1 Preparation

At time mortar or grout is placed, all reinforcement shall be free of mud, oil or other materials that might reduce bond.

15.3.2 Placing Tolerances

a. Place steel in walls and flexural elements within 1/2 inch when the distance (d) from centerline of steel to opposite face of masonry is equal to 8 inches or less, within one inch for d between 8 and 24 inches.

b. Place vertical bars in wall within 2 inches of indicated location along length of wall.

c. Bars may be moved as necessary to avoid interference with other reinforcing, conduits, or embedded items. If bars are moved more than specified tolerance, notify Contracting Officer for approval for resulting arrangement.

15.3.3 Securing Reinforcement

Support and fasten reinforcement to prevent displacement by construction loads or placement of grout or mortar. Lap or hook corner bars.

15.3.4 Details of Reinforcement

a. Clear distance between reinforcing bars and any face of masonry unit or formed surface, shall be as indicated but not less than 1/2 inch.

b. Get approval from Contracting Officer for all splices not indicated.

c. Do not bend embedded reinforcement.

d. Place joint reinforcement so that longitudinal wires are embedded in mortar with minimum cover of 1/2 inch when not exposed to weather or earth and 5/8 inch when exposed to weather or earth.

15.3.5 Wall Ties

Embed ends of wall ties in mortar joints.

15.3.5.1 Hollow Units

Wall tie ends shall engage outer face shells by at least 1/2 inch.

15.3.5.2 Solid Units

Embed wire wall ties at least 1 1/2 inch into mortar bed.

15.4 GROUTING

15.4.1 Preparation

Ensure that spaces to be grouted are free of mortar droppings, debris, loose aggregates and any material deleterious to masonry grout. Reinforcement and ties shall be in place before grouting.

15.4.2 Cleanouts

a. When grout pour exceeds 5 feet in height, provide cleanouts in bottom course of masonry in each grout pour.

b. Provide 3 inch minimum cleanout openings.

c. After cleaning, close cleanout openings and brace to resist grout pressure.

15.4.3 Placing Time

Place grout within 1-1/2 hours of introducing water to mixture. Sample and test grout, ASTM C 1019, for each 5,000 square feet of wall.

15.4.4 Pour Height

ACI 530.1.

15.4.5 Lift Height

Place grout in lifts not exceeding 5 feet. For 8 inch block wall, maximum lift is 2 feet.

15.4.6 Consolidation

Consolidate grout at time of placement.

a. Consolidate grout pours 12 inches or less in height by mechanical vibration or by puddling.

b. Consolidate pours exceeding 12 inches in height by mechanical vibration. Reconsolidate by mechanical vibration after initial water loss and settlement have occurred.

15.5 FIELD QUALITY CONTROL

15.6 CLEANING

a. Keep exposed surfaces clean during construction. Avoid smearing mortar on face of units.

b. Clean masonry with potable water. Detergents may be used.

c. Do not use acid, caustic solutions, or sandblasting.

d. Masonry shall be free of stains, efflorescence, mortar or grout droppings, and debris.

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SECTION 09900

PAINTS AND COATINGS

GENERAL

15.7 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

ACGIH TLV-BKLT	(1991-1992) Threshold Limit Values (TLVs) for Chemical Substances and Physical Agents and Biological Exposure Indices (BEIs)
ACGIH TLV-DOC	Documentation of Threshold Limit Values and Biological Exposure Indices

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 669	(1995) Glazing Compounds for Back Bedding and Face Glazing of Metal Sash
ASTM C 920	(1995) Elastomeric Joint Sealants
ASTM D 2092	(1995) Preparation of Zinc-Coated (Galvanized) Steel Surfaces for Painting
ASTM D 2824	(1994) Aluminum-Pigmented Asphalt Roof Coatings, Non-Fibered, Asbestos Fibered, and Fibered Without Asbestos
ASTM D 4214	(1997) Evaluating the Degree of Chalking of Exterior Paint Films
ASTM D 4263	(1983; R 1993) Indicating Moisture in Concrete by the Plastic Sheet Method

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910.1000	Air Contaminants

29 CFR 1910.1001	Asbestos, Tremolite, Anthophyllite, and Actinolite
29 CFR 1910.1025	Lead
29 CFR 1926.62	Lead Exposure in Construction

COMMERCIAL ITEM DESCRIPTIONS (CID)

CID A-A-341	(Rev. A) Pigment, Aluminum, Powder and Paste
CID A-A-378	Putty, Linseed Oil Type (For Wood Sah Glazing
CID A-A-1500	(Rev. A) Sealer, Surface (Latex Block Filler)
CID A-A-1558	(Rev. A) Paint, Stencil
CID A-A-1800	Varnish, Oil: Spar
CID A-A-2246	Paint, Latex (Gloss, Interior)
CID A-A-2335	Sealer, Surface (Varnish Type, Wood and Cork Floors)
CID A-A-2336	(Rev. A) Primer Coating (Alkyd, Exterior Wood, White and Tints)
CID A-A-2904	Thinner, Paint, Mineral Spirits, Regular and Odorless
CID A-A-2962	Enamel, Alkyd, Class A, Grade C
CID A-A-2994	Primer Coating, Interior, for Walls and Wood
CID A-A-3054	Paint, Heat Resisting (400 Degrees F)
CID A-A-3067	Paint, Alkyd, Exterior, Low VOC
CID A-A-3120	Paint, For Swimming Pools
CID A-A-50557	Primer, Water-Borne, Acrylic or Modified Acrylic, For Metal Surfaces
CID A-A-50570	Paint, Water-Borne, Acrylic or Modified Acrylic, Semigloss, for Metal Surfaces

CID A-A-50574	Enamel, Odorless, Alkyd, Interior, Semigloss, White and Tints

FEDERAL STANDARDS (FED-STD)

FED-STD-313	(Rev. C) Material Safety Data, Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities

FEDERAL SPECIFICATIONS (FS)

FS TT-P-19	(Rev. D; Am. 1) Paint, Latex (Acrylic Emulsion, Exterior Wood and Masonry)
FS TT-P-28	(Rev. G) Paint, Aluminum, Heat Resisting (1200 DEG. F)
FS TT-P-29	(Rev. K) Paint, Latex Base, Interior, Flat, White and Tints
FS TT-P-38	(Rev. E) Paint, Aluminum (Ready-Mixed)
FS TT-E-487	(Rev. E; Am. 1) Enamel: Floor and Deck
FS TT-E-489	(Rev. J) Enamel, Alkyd, Gloss, Low VOC Content
FS TT-E-506	(Rev. K) Enamel, Alkyd, Gloss, Tints and White
FS TT-C-542	(Rev. E) Coating, Polyurethane, Oil-Free, Moisture Curing
FS TT-C-555	(Rev. B; Am. 1) Coating, Textured (for Interior and Exterior Masonry Surfaces)
FS TT-P-641	(Rev. G; Am. 1) Primer Coating, Zinc Dust-Zinc Oxide (For Galvanized Surfaces)
FS TT-P-645	(Rev. B) Primer, Paint, Zinc-Molybdate, Alkyd Type
FS TT-P-650	(Rev. D) Primer Coating, Latex Base, Interior, White (for Gypsum Wallboard or Plaster)

FS TT-P-664	(Rev. D) Primer Coating, Alkyd, Corrosion-Inhibiting, Lead and Chromate Free, VOC-Compliant
FS TT-S-708	(Rev. A; Am. 2) Stain, Oil: Semi-Transparent, Wood, Exterior
FS TT-S-711	(Rev. C) Stain; Oil Type, Wood, Interior
FS TT-E-1593	(Rev. B) Enamel, Silicone Alkyd Copolymer, Gloss (For Exterior and Interior Use)
FS TT-E-2784	(Rev. A) Enamel (Acrylic Emulsion, Exterior)

MILITARY SPECIFICATIONS (MIL)

MIL-P-24441	(Rev. B; Supp. 1) Paint, Epoxy-Polyamide
MIL-C-24667	(Rev. A) Coating System, Nonskid, for Roll or Spray Application (Metric)
MIL-PRF-85285	(Rev. C) Coatings: Polyurethane, High-Solids

MILITARY STANDARDS (MIL-STD)

MIL-STD-101	(Rev. B) Color Code for Pipelines and for Compressed Gas Cylinders

STEEL STRUCTURES PAINTING COUNCIL (SSPC)

SSPC Guide 6	(1995) Containing Debris Generated During Paint Removal Operations
SSPC Guide 7	(1995) Disposal of Lead-Contaminated Surface Preparation Debris
SSPC QP 1	(1989) Evaluating Qualifications of Painting Contractors (Field Application to Complex Structures)
SSPC PA 1	(1991) Shop, Field, and Maintenance Painting
SSPC PA 3	(1995) Safety in Paint Application

SSPC VIS 3	(1995) Visual Standard for Power-and Hand-Tool Cleaned Steel (Standard Reference Photographs)
SSPC SP 1	(1982) Solvent Cleaning
SSPC SP 2	(1995) Hand Tool Cleaning
SSPC SP 3	(1995) Power Tool Cleaning
SSPC SP 5	(1994) White Metal Blast Cleaning
SSPC SP 6	(1994) Commercial Blast Cleaning
SSPC SP 7	(1994) Brush-Off Blast Cleaning
SSPC SP 10	(1994) Near-White Blast Cleaning
SSPC SP 12	(1995) Surface Preparation and Cleaning of Steel and Other Hard Materials by High-and Ultrahigh-Pressure Water Jetting Prior to Recoating
SSPC Paint 20	(1991) Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic")
SSPC Paint 21	(1991) White or Colored Silicone Alkyd Paint Type I, High Gloss Type II, Medium Gloss
SSPC Paint 22	(1991) Epoxy-Polyamide Paints (Primer, Intermediate, and Topcoat)
SSPC Paint 23	(1991) Latex Primer for Steel Surfaces
SSPC Paint 24	(1991) Latex Semi-Gloss Exterior Topcoat
SSPC Paint 104	(1991) White or Tinted Alkyd Paint

15.8 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

15.8.1 SD-02 Manufacturer's Catalog Data

a. Coating

b. Sealant

15.8.1.1 Requirements

For each type of coating, sealant, or other product furnished:

a. Submit data from the manufacturer's paint laboratory indicating that the product conforms to requirements of the referenced specification.

15.8.2 SD-06 Instructions

a. Application instructions

b. Manufacturer's material safety data sheets

Submit Manufacturer's material safety data sheets for coatings, solvents, and other potentially hazardous materials, as defined in FED-STD-313.

15.8.3 SD-08 Statements

a. Applicator's qualifications

b. Evidence of acceptable variation

15.8.3.1 Applicator's Qualifications

a. Submit evidence that applicator has satisfactorily applied paint by airless spray at minimum of two sites. Indicate names and locations of sites, and type and design of equipment used, including safety devices.

15.8.3.2 Evidence of Acceptable Variation

If a product proposed for use does not conform to requirements of the referenced specification, submit for approval to the Contracting Officer, evidence from the paint manufacturer's laboratory that the proposed product is either equal to or better than the product specified. The submittal shall include the following:

a. Identification of the proposed substitute;

b. Reason why the substitution is necessary;

c. A comparative analysis of the specified product and the proposed substitute, including tabulations of the composition of pigment and vehicle;

d. The differences between the specified product and the proposed substitute; and

e. Other information necessary for an accurate comparison of the proposed substitute and the specified product.

15.8.4 SD-14 Samples

a. Color

Submit manufacturer's samples of paint colors. Cross reference color samples to color scheme as indicated.

15.9 QUALITY ASSURANCE

15.9.1 Qualifications of Airless Spray Applicators

Satisfactory application of paint by airless spray at a minimum of two sites.

15.10 REGULATORY REQUIREMENTS

15.10.1 Lead Content

Do not use coatings having a lead content over 0.06 percent by weight of nonvolatile content.

15.10.2 Chromate Content

Do not use coatings containing zinc-chromate or strontium-chromate.

15.10.3 Asbestos Content

Materials shall not contain asbestos.

15.10.4 Mercury Content

Materials shall not contain mercury or mercury compounds.

15.10.5 Silica Sand

The use of silica sand is prohibited.

15.10.6 Human Carcinogens

Materials shall not contain ACGIH TLV-BKLT and ACGIH TLV-DOCconfirmed human carcinogens (A1) or suspected human carcinogens (A2).

15.11 PACKAGING, LABELING, AND STORAGE

Paints shall be in sealed containers that legibly show the contract specification number, designation name, formula or specification number, batch number, color, quantity, date of manufacture, manufacturer's formulation number, manufacturer's directions including any warnings and special precautions, and name and address of manufacturer. Pigmented paints shall be furnished in containers not larger than 5 gallons. Paints and thinners shall be stored in accordance with the manufacturer's written directions, and as a minimum, stored off the ground, under cover, with sufficient ventilation to prevent the buildup of flammable vapors, and at temperatures between 40 to 95 degrees F.

15.12 SAFETY METHODS

Apply coating materials using safety methods and equipment in accordance with the following:

15.12.1 Safety Methods Used During Coating Application

Comply with the requirements of SSPC PA 3.

15.12.2 Toxic Materials

To protect personnel from overexposure to toxic materials, conform to the most stringent guidance of:

a. The chemical manufacturer when using mineral spirits, or other chemicals. Use impermeable gloves, chemical goggles or faceshield, and other recommended protective clothing and equipment to avoid exposure of skin, eyes, and respiratory system. Conduct work in a manner to minimize exposure of building occupants and the general public.

b. 29 CFR 1910.1000.

c. ACGIH TLV-BKLT, threshold limit values.

d. Manufacturer's material safety data sheets (MSDS).

15.13 ENVIRONMENTAL CONDITIONS

15.13.1 Exterior Coatings

Do not apply coating to surfaces during foggy or rainy weather, or under the following surface temperature conditions:

a. Less than 5 degrees F above dew point;

b. Below 40 degrees F (for oil-based paints), 50 degrees F (for latex paints or over 95 degrees F, unless approved by the Contracting Officer.

15.14 COLOR SELECTION

Colors of finish coats shall be as indicated or specified. Where not indicated or specified, colors shall be selected by the Contracting Officer. Manufacturers' names and color identification are used for the purpose of color identification only. Named products are acceptable for use only if they conform to specified requirements. Products of other manufacturers are acceptable if the colors approximate colors indicated and the product conforms to specified requirements.

15.15 LOCATION AND SURFACE TYPE TO BE PAINTED

15.15.1 Painting Included

Where a space or surface is indicated to be painted, include the following unless indicated otherwise.

a. Surfaces behind portable objects and surface mounted articles readily detachable by removal of fasteners, such as screws and bolts.

b. New factory finished surfaces that require identification or color coding and factory finished surfaces that are damaged during performance of the work.

c. Existing coated surfaces that are damaged during performance of the work.

15.15.2 Painting Excluded

Do not paint the following unless indicated otherwise.

a. Surfaces concealed and made inaccessible by panelboards, fixed ductwork, machinery, and equipment fixed in place.

b. Surfaces in concealed spaces. Concealed spaces are defined as enclosed spaces above suspended ceilings, furred spaces, attic spaces, crawl spaces, and chases.

c. Steel to be embedded in concrete.

d. Copper, stainless steel, aluminum, brass, and lead except existing coated surfaces.

PRODUCTS

15.16 MATERIALS

Conform to the specifications and standards referenced in PART 3.

15.16.1 Latex Block Filler

CID A-A-1500.

EXECUTION

15.17 PROTECTION OF AREAS AND SPACES

Prior to surface preparation and coating applications, remove, mask, or otherwise protect, hardware, hardware accessories, machined surfaces, radiator covers, plates, lighting fixtures, public and private property, and other such items not to be coated that are in contact with surfaces to be coated. Following completion of painting, workmen skilled in the trades involved shall reinstall removed items. Restore surfaces contaminated by coating materials, to original condition and repair damaged items.

15.18 SURFACE PREPARATION

Remove dirt, splinters, loose particles, grease, oil, disintegrated coatings, and other substances deleterious to coating performance as specified for each substrate.

15.18.1 Existing Coated Surfaces with Minor Defects

Sand, spackle, and treat minor defects to render them smooth. Minor defects are defined as scratches, nicks, cracks, gouges, spalls, alligatoring, chalking, and irregularities due to partial peeling of previous coatings.

15.19 PREPARATION OF CONCRETE AND CEMENTITIOUS SURFACE

15.19.1 Concrete and Masonry

a. Surface Cleaning: Remove the following deleterious substances.

(1) Dirt, Chalking, Grease, and Oil: Wash new and existing uncoated surfaces with a solution composed of 1/2 cup trisodium phosphate, 1/4

cuphousehold detergent, and 4 quarts of warm water. Then rinse thoroughly with fresh water. Wash existing coated surfaces with a suitable detergent and rinse thoroughly. For large areas, water blasting may be used.

(2) Fungus and Mold: Wash new, existing coated, and existing uncoated surfaces with a solution composed of 1/2 cup trisodium phosphate, 1/4 cup household detergent, 1 quart 5 percent sodium hypochlorite solution and 3 quarts of warm water. Rinse thoroughly with fresh water.

(3) Paint and Loose Particles: Remove by wire brushing.

(4) Efflorescence: Remove by scraping or wire brushing followed by washing with a 5 to 10 percent by weight aqueous solution of hydrochloric (muriatic) acid. Do not allow acid to remain on the surface for more than five minutes before rinsing with fresh water. Do not acid clean more than 4 square feet of surface, per workman, at one time.

b. Cosmetic Repair of Minor Defects: Repair or fill mortar joints and minor defects, including but not limited to spalls, in accordance with manufacturer's recommendations and prior to coating application.

c. Allowable Moisture Content: Latex coatings may be applied to damp surfaces, but not to surfaces with droplets of water. Do not apply epoxies to damp surfaces as determined by ASTM D 4263. Allow surfaces to cure a minimum of 30 days before painting.

15.20 APPLICATION

15.20.1 Coating Application

Apply coating materials in accordance with SSPC PA 1. SSPC PA 1methods are applicable to all substrates, except as modified herein. Thoroughly work coating materials into joints, crevices, and open spaces. Touch up damaged coatings before applying subsequent coats.

a. Drying Time: Allow time between coats, as recommended by the coating manufacturer, to permit thorough drying, but not to present topcoat adhesion problems. Provide each coat in specified condition to receive next coat.

b. Primers, and Intermediate Coats: Do not allow primers or intermediate coats to dry more than 30 days, or longer than recommended by manufacturer, before applying subsequent coats. Follow manufacturer's recommendations for surface preparation if primers or intermediate coats are allowed to dry longer than recommended by manufacturers of subsequent coatings. Each coat shall cover surface of preceding coat or surface completely, and there shall be a visually perceptible difference in shades of successive coats.

c. Finished Surfaces: Provide finished surfaces free from runs, drops, ridges, waves, laps, brush marks, and variations in colors.

15.20.2 Equipment

Apply coatings with approved brushes, approved rollers, or approved spray equipment, unless specified otherwise. Spray areas made inaccessible to brushing by items such as ducts and other equipment.

15.20.3 Thinning of Paints

Reduce paints to proper consistency by adding fresh paint, except when thinning is mandatory for the type of paint being used. Obtain written permission from the Contracting Officer to use thinners. The written permission shall include quantities and types of thinners to use.

15.20.4 Coating Systems

a. Systems by Substrates: Apply coatings that conform to the respective specifications listed in the following Tables:

Table

4 Exterior Concrete, Concrete Masonry, and Stucco

b. Minimum Dry Film Thickness (DFT): Apply paints, primers, varnishes, enamels, undercoats, and other coatings to a minimum dry film thickness of 1.5 mil each coat unless specified otherwise in the Tables. Coating thickness where specified, refers to the minimum dry film thickness. The DFT range specified for MIL-C-24667 represents minimum peak and valley measurements.

c. Coatings for Surfaces Not Specified Otherwise: Coat surfaces which have not been specified, the same as surfaces having similar conditions of exposure.

d. Existing Surfaces Damaged During Performance of the Work, Including New Patches In Existing Surfaces: Coat surfaces with the following:

(1) One coat of primer.

(2) One coat of undercoat or intermediate coat.

(3) One topcoat to match adjacent surfaces.

e. Existing Coated Surfaces To Be Painted: Apply coatings conforming to the respective specifications listed in the Tables herein, except that pretreatments, sealers and fillers need not be provided on surfaces where existing coatings are soundly adhered and in good condition. Do not omit undercoats or primers.

15.21 COATING SYSTEMS FOR CONCRETE AND CEMENTITIOUS SUBSTRATES

Apply coatings of Table 4.

15.22 INSPECTION AND ACCEPTANCE

In addition to meeting previously specified requirements, demonstrate mobility of moving components, including swinging and sliding doors, cabinets, and windows with operable sash, for inspection by the Contracting Officer. Perform this demonstration after appropriate curing and drying times of coatings have elapsed and prior to invoicing for final payment.

TABLE 4

EXTERIOR CONCRETE, CONCRETE MASONRY, STUCCO, AND ASBESTOS-CEMENT SURFACES

A. New and existing concrete; including soffits but excluding tops of slabs:

Primer: CID A-A-1500 on existing concrete
Intermediate: FS TT-P-19 1.5 mils DFT
Topcoat: FS TT-P-19 1.5 mils DFT

Primer: As recommended by manufacturer of FS TT-C-555
Intermediate: FS TT-C-555, Type II (see note)
Topcoat: FS TT-C-555, Type II (see note)

NOTE: Sufficient coats to provide no less than 20 mils of finished coating system. Texture: sand

B. New and existing concrete masonry on uncoated surface:

Primer: CID A-A-1500 on existing
Intermediate: FS TT-P-19 1.5 mils DFT
Topcoat: FS TT-P-19 1.5 mils DFT

Primer: As recommended by manufacturer of FS TT-C-555
Intermediate: FS TT-C-555, Type II (see note)
Topcoat: FS TT-C-555, Type II (see note)

NOTE: Sufficient coats to provide no less than 20 mils of finished coating system. Texture: sand

C. New and existing stucco:

Primer: FS TT-P-19 1.5 mils DFT
Intermediate: N/A
Topcoat: FS TT-P-19 1.5 mils DFT

Primer: As recommended by manufacturer of FS TT-C-555
Intermediate: FS TT-C-555, Type II (see note)
Topcoat: FS TT-C-555, Type II (see note)

NOTE: Sufficient coats to provide no less than 20 mils of finished coating system. Texture: sand

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